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Our Rubber Trade as England Sees It.

"THERE appears to be less hope than ever for foreign exporters of manufactured rubber articles to the States," our London contemporary is forced to admit in a lengthy review of the India rubber statistics last issued from Washington. Our contemporary never fails to devote much care and considerable space to these reports, taking occasion at times, as in its last number, to observe that the statistical work of our Treasury Department is excellently done, though, perhaps, lacking in promptness in making the results public. Contrasting the value of the imports of crude rubber by the United States for a series of years, the *Journal* notes that "the imports for the [first] eleven months of 1890 exceed those of the [first] eleven months of 1885 by no less than \$7,087,926 value, or an advance of 84 per cent., a rise which, apart from the recent increase in average value, speaks volumes for the development of the American rubber trades."

The *Journal* might have added force to this showing by giving a comparative statement of British imports of crude India rubber for the years named. That would show the imports for 1890 to have been less than 65 per cent. in advance of those for 1885. But not even that advance can be claimed for the British rubber industries. It must be remembered that when the United States imports 33,842,374 pounds of crude gum, as was the case in the last fiscal year, it is practically all consumed by home manufacturers. Of the immense amount here noted only 330,032 pounds were reshipped in a crude shape—scarcely an appreciable reduction of the total. Of British imports of rubber, on the other hand, a very considerable share is exported in a crude condition, for the use of foreign manufacturers.

The following table will illustrate how far this has been true in late years:

	Cwts. Imported.	Cwts. Exported.	Cwts. Retained.
In 1885.	180,141	89,810	91,331
In 1886.	192,518	111,437	81,081
In 1887.	235,539	116,570	118,969
In 1888.	218,171	127,814	90,357
In 1889.	236,310	130,506	105,804
In 1890.	264,009	142,508	121,501

If we consider only the amounts of crude rubber actually retained by Great Britain for manufacturing purposes in each year, not only does the amount appear small by comparison with what is actually consumed in the United States, but it will be seen that the rate of growth has not been rapid. Compare, for instance, the amount of crude rubber available for British manufactures in 1890, or 121,501 cwt., with the 91,331 cwt. similarly available in 1885, and the advance for the term of six years will be found to be only 33 per cent. If, however, the values of the rubber be used as a basis for comparison, the advance will be found to be 44 per cent. But there is no basis upon which such a marked advance in English rubber industries can be figured out as our contemporary has calculated for the manufactures of this country.

The *Journal*, proceeds, in its studies of our trade, to note an increase in our exports of rubber goods, other than

boots and shoes, of more than \$250,000 in a period of one year, ending with this observation: "For every dollar's worth of foreign manufactures received, therefore, the American manufacturers export more than two dollars worth; this, too, leaving out of account the exports of boots and shoes, for which the latest figures follow. * * * This branch, it will be seen, adds a considerable sum to the value of the export trade to the rubber manufacturers of the States."

It is fair to say, especially since our contemporary has taken the trouble to make such a very favorable showing for American industry, that in the comparisons here made, India rubber and gutta percha have been included together in the American reports, while India rubber alone is included in the English statistics used. Even with this difference removed, however, there would be no material change from the results arrived at from the comparisons made.

The Brazilian Reciprocity Plan.

SINCE the last issue of THE INDIA RUBBER WORLD, official information has reached this country of the promulgation in Brazil of the new reciprocity agreement arrived at between the two greatest republics on the continent. Newspapers which have arrived here from Rio, contain reports of Brazilian sentiment favorable to the new arrangement, though this feeling may undergo a change in case the effect upon the income from customs in Brazil should be a marked reduction, making it necessary for the people there to supply the deficit in the revenues with direct taxation.

Perhaps the subject of reciprocity between the United States and Brazil has nowhere received greater attention, however, than in Great Britain, where the publication of the terms of the agreement was awaited with great interest. The government there has been plied with anxious questions as to the probable effect of the new arrangement upon British commerce, but none of the answers which have been forthcoming so far have been of a reassuring character. What has been most discouraging in this respect is the evident inability of Her Majesty's Government to take any steps to neutralize the effect of the advantages granted by Brazil to American trade over that of Great Britain. It is evident from the tone of the English press that Mr. Blaine's reciprocity plan is not regarded there as a step toward the adoption of the free-trade policy to which the English people are committed. On the contrary they would much prefer the permanent retention of the custom-houses in Brazil.

As for the probable effect of the new arrangement upon the rubber traffic, it is not probable that any can reasonably be looked for, especially since rubber was not one of the commodities directly considered in the forming of the new agreement. On general principles, however, whatever may have the effect of stimulating commerce between this country and Brazil, increasing the frequency of communication and cheapening transportation, can hardly fail to prove beneficial to the rubber interests. If the way is

opened for a heavier traffic in other commodities between the two countries, it is possible that the effect will be to hasten the investment of American capital in Brazil, with the result of finally taking at least a portion of the crude rubber business out of the monopolistic hands which now control it.

Our Rubber Imports and Exports.

The imports of India rubber and gutta percha, crude, by the United States during the calendar year 1890 are stated by the Treasury Department to have amounted to 34,606,171 pounds, valued at \$16,719,608, or an average of 45.4 cents per pound. The imports during 1889 were 32,138,257 pounds, valued at \$12,503,254, or an average of 38.9 cents per pound.

India rubber and gutta percha imports have been separated in the reports only during the latter part of the year. Of the imports for December 2,790,091 pounds were of rubber and 123,651 of gutta percha. The average value of the India rubber imported during the month was 44.3 cents per pound and the average value of gutta percha is reported at 9.1 cents per pound.

Deducting the amount of crude India rubber and gutta percha exported, or reshipped, the amount which remained available for our manufacturers and remaining in stocks was 34,189,209 pounds in 1890, against 31,842,439 in the preceding year.

The growth of the industry may be represented, to some extent, by this comparative statement of the value of imports of India rubber and gutta percha for the years named:

In the year 1885.	\$ 9,697,239
In the year 1886.	14,180,301
In the year 1887.	14,389,499
In the year 1888.	14,228,358
In the year 1889.	12,503,254
In the year 1890.	16,719,608

It may be mentioned the figures for last year exceed the average for the five years preceding by \$3,719,878.

The exports and imports of manufactures of India rubber and gutta percha for 1890, as compared with the previous year, are compared as follows:

	1889.	1890.
Exports, Boots and Shoes, pairs	154,086	147,964
Boots and Shoes, value	\$127,655	\$126,130
All other Goods, value	809,842	1,045,021
Total value	937,497	1,171,151
Imports, all classes	\$348,023	\$378,671

The excess over imports of rubber manufacturers thus appears to have been \$589,474 in 1889, and \$792,480 in 1890.

The Latest African Rubber Story.

"IN Emin's province," says A. J. M. Jephson, one of Explorer Stanley's lieutenants on his last expedition through the Dark Continent, "are vast quantities of India rubber-trees, and Emin sent to Khartoum a hundred lumps of this stuff as big as your hat. It was four or five years old, and yet, when a lump was cut open,

the interior was as yellow and clear as amber. If a lump of this rubber were dropped it would rebound as high as one's head. The traders in Khartoum said it was vastly superior to the Brazilian product. From the fact that it had been kept without rotting for four years in that climate, they claimed that the natives were proficient in the art of curing. The natives, you know, use it for smearing the inside of their wicker baskets, which they weave very nicely so as to hold water, and they make them into knobs for drumsticks too. This one product alone will pay for the labor, and money and time, put into the expedition, for it exists in almost inexhaustible quantities."

For Standard Measurements in Rubbers.

THE following important letter from the President of the Retail Shoe Dealers' National Association, explains itself fully, and the subject treated certainly commends itself to the attention of manufacturers of rubber footwear :

FORT EDWARD, N. Y., March 7, 1891.

DEAR SIR:—I am sure you will pardon the liberty I take in addressing you, but retailers have reason to believe in you from your promptness to meet with them in conventions and participate in their efforts in advancement.

At present I wish to interest you in a matter of much moment to the retailer and no less to the manufacturer. The great achievement of our Association thus far has been to secure the adoption of Standard Last measurements in the boot and shoe department of leather goods, which has proved of great practical utility. A manufacturer of this date who disregards standard measurements is unwise and an enemy to his brother manufacturers, as well as his patron the retailer. Knowing that your acquaintance is extended, and that your avocation is connected with the manufacture of lasts, I ask of you as a friend to the retailer, if there is no way possible by which we can persuade manufacturers of rubber goods to also adopt a uniform standard of measurements of lasts, securing the same benefits of uniformity as now exists in boots and shoes made of leather.

It would seem an easy matter, as there are only comparatively a few manufacturers of rubber goods; but, with each one with different styles and standard of measurements, entails needless confusion. Of course it is expected that each will retain and advance stylish footwear, but it appears that they might readily adopt uniform measurements of sizes.

Will you not lend a kindly helping hand in this matter, to enable the present officers to bring this subject matter before the said rubber manufacturers, that we may urge upon them what cannot fail to prove advantageous to them as well as the retailer?

Any suggestions you may offer will be fully appreciated and duly considered. That companies who will adopt standard uniform measurements of lasts will be sought after and patronized by retailers, is self-evident, provided their product is equally desirable.

Yours very truly,

JAMES G. KINNE, President,
National Association Retail Shoe Dealers.

To C. F. Parker, Esq.,
Manager Metal Last and Tree Co.,
Boston, Mass.

Not Afraid of a "Corner" in Para.

OUR London contemporary takes a very optimistic view of the Pará rubber situation, so far as the subject of a "corner" by the speculators there is concerned. In its leading article in the February issue it says:

"Meanwhile, shrewd men of business in Great Britain and in the United States have openly declared their disbelief in the existence of any such scheme as described. The rumor is regarded by many as a mere feaver to bring about a further rise of prices. From all we hear we are not ourselves disposed to attach much importance to the statements put forth by interested persons. That the speculator is very likely to try his hand, again and again, at cornering rubber, is very probable; but that a real success is by any possibility within his grasp we do not believe. The increasing yield of the present sources of supply, and the immediate prospect of the large development of fresh sources, put insuperable obstacles in the way of those blacklegs of commerce to whom international trade is simply a means of carrying out their own dirty tricks."

The Development of Foreign Trade.

AT the last annual dinner of the New York Chamber of Commerce, Hon. Carl Schurz responded to the toast "The Development of our Foreign Commerce," and in the course of his remarks said several things of great practical value to those of our merchants who are looking to an extension of their trade among foreign customers. Said he:

"There is among the people a very general feeling that something ails them, for which the extension of our foreign commerce would afford at least a partial remedy. But when the means are discussed by which that extension is to be brought about, we frequently witness wonderful efforts at profound reasoning and beating about the bush, as if there were some dark mystery to be solved. I do not think there is. Like many other things, our problem of foreign commerce may be reduced to very simple principles which will be universally recognized by all who do one thing: take the politics out of the matter and judge it on its own merits. This is important, I have known good business men in whose otherwise cool and clear heads politics would turn the very multiplication table upside down.

"If we wish further to extend and develop our foreign commerce, these things are necessary:

"(1) That we should have something to sell.

"(2) That we should adapt the goods we wish to sell to the requirements and tastes of those to whom we wish to sell them.

"(3) That we should be able to sell our goods as cheaply as goods of the same kind and quality are sold by other people in the same market.

"(4) That if we sell to foreign nations we must be willing to buy from them, one-sided international trade being a contradiction in itself.

"You will tell me that there is nothing new in this. Certainly there is not. It is an old story, as old as common sense. But it is amazing how far some people contrive to get away from such self-evident truths as soon as the practical application is called for.

"As to the first point, we surely have a great many things to sell. There is the surplus of agricultural products. There are almost boundless natural resources of raw material for manufacturing industries. There are several of these industries, the mechanical appliances and the laboring force engaged in which,

as has been computed by good authority, are capable of producing in seven or eight months as much as the home market will regularly absorb in twelve. There are, in addition to this, American enterprise, energy, and inventive genius, capable of increasing incalculably the production of things to sell and to feed our commerce, if given a fair chance.

"As to the second point, the adaptation of our products to the requirements of the foreign market, we find here and there among our business men the lofty notion that the foreign consumer should cultivate his tastes according to our ideas of what is good for him. Our practical business men, wishing to establish themselves in foreign markets, will not carry their missionary work too far. Let me illustrate my meaning by a personal experience. Last year I was in Europe, and one day dined at the house of a prominent merchant in Hamburg. There were about twenty ladies and gentlemen at the table. The dinner talk brought me one surprise after another. It turned out that most of the ladies present—I think even all of them—had been across the seas, and spoke about Hong Kong, Shanghai, Bombay, Zanzibar, Mexico, Montevideo, Buenos Ayres, Rio, Valparaiso, Havana, etc., as familiarly as our ladies speak about Long Branch, Newport or Bar Harbor. All these ladies had lived at such places with their husbands—merchants who were still in business in foreign parts, or had been there in their younger days, either having establishments of their own or acting for German houses—but in either case studying the habits and tastes of foreign peoples, and the requirements of foreign markets as well as the export resources of foreign countries, and giving the commerce of their German home the benefit of their studies and experiences. The company I met represented the rule among that class of business men, whose education is scarcely considered complete without the foreign course. Do you not think that, when we hear of German commerce crowding out that of other nations in many parts of the world, this fact may in some measure be owing to the systematic care with which the study of foreign markets is cultivated? Now, if our young merchants, married or unmarried, devoted a little less time to Fifth Avenue, Newport and Paris, and a little more to Buenos Ayres, Rio, Valparaiso, Shanghai, Zanzibar, and similar places, thus enlarging their mercantile education too, would not that be likely to do our foreign commerce a world of good?"

The Manufacture of Fabrics for Rubber Clothing.

SPEAKING of the growth of the fabric trade, Mr. J. A. Churchill, of J. Galt Smith & Co., New York, said a few days ago: "It was in 1877 that the first plain fabric, or plain woven 72 by 80 cloth was made and put upon the market. Large sales of it took place and it was what was called the bronze foulard, in 72 by 80, 96 by 104, 104 by 108 and 120 inches square. The prices asked for these goods ranged then from 10 to 25 cents; the ten-cent grade now selling for 8½ cents. The first company that made these goods was the Gossamer Rubber Clothing Co., owned by the Messrs. Conant, which was closely followed by the Domestic and the Stoughton companies. Afterwards a large number of companies came into existence, notably the American, the Columbia, Prince & Aldrich, shortly afterwards the Pará and the Standard, then some Western concerns, rounding off with the Chicago, London and Cleveland companies.

"Business at once assumed very large proportions, and an immense quantity of this foulard cloth was sold aggregating twenty million of yards, or five million pounds before 1882. The business by this time was unmistakeably overdone, and a

reaction set in during that year, and with the depression in various commodities that existed in the country at that time, the cloth business was no exception, and it was not until 1885 that a revival of the former activity took place. A change in the quality and style of goods asserted itself at this juncture, and a demand sprung up for printed surfaced cloths, closely resembling woolens and high-grade dress goods. The general effects in these low-priced goods were equal to those of the high-priced fabrics of which they were an imitation, to a very large extent, and the business assumed an importance in which ingenuity and taste brought substantial rewards. There has been a steady improvement in these goods from that time, and now the gossamer rubber companies make up large quantities of silks and run the gamut of all classes of that style of goods, also worsteds, woolens, mixed woolens and cottons, and cottons, until now there is hardly any fabric that is not used in this waterproofing. In addition, there has been during all this time, a steady improvement in the quality and every detail, and shapes, patterns, and the general appearance of the garment has claimed the closest attention. There are no foreign goods that can compete with us in quality, the close competition we have here bringing forth the best efforts of one after another manufacturer to get as nearly to perfection as he could from time to time. We have learned a great deal by experience in obtaining the proper dyes, and we are far ahead of European manufacturers in that respect. There are some anilines that antagonize rubber, and whenever they are used they disintegrate the rubber and make it sticky and give it a strong odor. We have overcome all that in our preparations. The principal cost of our goods is in the labor and finishing. The cloth itself is cheap, and if we were not careful, our losses would be heavy.

There are twenty-two companies in the country making a product worth approximately six million dollars, but the policy pursued by all is not altogether the wisest. The goods, of course, are of a seasonable character, and in a portion of the year no one can manage to fill orders promptly.

In dull times, however, the factories are apt to close, and not much stock is made ahead, as ought to be the case. The manufacturer is also anxious to sell all the time, and if he cannot get a profit, he will take a loss. This keeps the business in a perturbed condition, whereas a little patience would make different results.

The companies, however, have made money; some of them have done very handsomely. In the past it seems to have been a business in which one could start with a few thousand dollars, and, with the indispensable factor of brains, divide up handsome dividends ever after. Some dividends are now larger than the original capital. One or two companies with plenty of capital made a side issue of the business, but the rule has been a very small sum at the outset.

The export business has been almost totally neglected. Travelling men go to Montreal and Canadian points, but nowhere else. It is believed, however, that there is a rich harvest for the pioneer in the export trade. Even the French, with their good taste, chic and other renowned qualities, make nothing to compare with our goods in quality, style, finish or shape, and it is very certain that a bold dealer could take his stock on the *Bon Marché*, and clothe the Parisians to an extent that would send a golden stream into his pockets, and bring an army of American followers to his aid.

On this continent the garments that we make would be very serviceable compared with importations from abroad, to them, but not even Mexico knows of them, and this trade is all in the future. At this time it would not be a matter of price, but simply of getting a fabric that would be unlike the acid cured goods of Europe, compared with which a drenched garment is preferred by the majority.

New Goods in the Market.

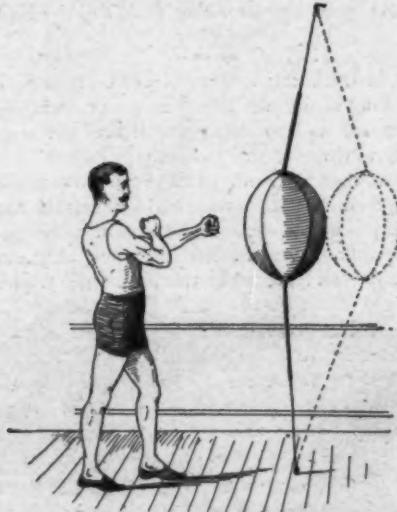
TO MANUFACTURERS AND PATENTEES :

It is our aim to embody in this department descriptions and illustrations of all the latest novelties introduced in the market, to the end that jobbers, retailers and buyers of rubber goods generally may look here for information as to everything new that each month or season brings forth. Manufacturers and patentees are, therefore, most cordially invited to co-operate with us in making the department as complete and attractive as possible—the distinct understanding being that no charge whatsoever, either direct or indirect, will be made for these publications. Our reward will come through giving our readers valuable information; and that will be reward enough if manufacturers but give the information freely and in all cases at the earliest practicable moment.

In forwarding descriptions of new goods, be careful to write on one side of the paper only; be brief, but always write enough to give the buyer a clear idea of the article you offer; give your full address, plainly written; and in all cases send a small illustration or wood cut if you have one.

A FIRM of rubber manufacturers in Birmingham, England, are offering to the trade a new patent horse collar lined with a special preparation of sheet rubber, for which many advantages are claimed over collars lined with leather in the usual way. The India rubber lining is much softer, it is claimed, and more pliable to the horse's neck; it has a much cooler and a more even surface; not being porous it will not absorb the animal heat and perspiration; always remaining dry, it will not crack as it is the tendency of leather to do. It is claimed in addition to these advantages, due to the nature of the material that rubber-lined collars serve to prevent soreness of the neck and shoulders. Finally, these collars, it is stated, are more durable, though not more costly, than those lined with leather.

A striking bag that is in use in many gymnasias, and is at once simple, and useful is here shown. It is made of the best



quality leather, hand stitched, and is first-class in every respect, inclosing a heavy rubber bladder. It is suspended from the ceiling by a rubber cord, and attached to the floor also. Speci-ally adapted to rooms where the bag should not strike the ceiling. Manufactured by Horace Partridge & Co., Boston, Mass.

—Clark's Linen Fire Hose, although not exactly a new article, as it was introduced to the United States nearly forty years ago, has, however, points of excellence that can be dwelt

upon very often and not exhausted. It has great strength and remarkable tightness for a fabric hose. That it may be preserved from mildew, the flax of which it is made is subjected to a chemical process before the weaving. Quite lately the com-



pany manufacturing this hose have greatly enlarged their facilities, and are turning out a magnificent article. It is made to conform strictly to the requirements and specifications of the Associated Factory Mutual Insurance Cos.; and is fully guaranteed in every particular. It is sold by the Crosby Steam Gauge and Valve Co., 93 Oliver Street, Boston.

—With a somewhat surprising yet commendable degree of promptitude have the manufacturers of storm-day apparel pushed their improved productions into the favorable considera-tion of the steadily increasing number of admirers and pur-

chasers of high-grade clothing. By discreet and discerning buyers the mackintosh has received a greater amount of favor than formerly accorded ordinary rubber garments. It is this fact that has induced jobbers to bestow much care in selection, and prompted manufacturers to diligent efforts in choosing fabrics, in originating designs, and in securing the best of workmen.

Among the many well-known business firms of the metropolis, none stand forth more prominently, as indefatigable, painstaking manufacturers of handsome, reliable waterproof apparel, than the widely-known Metropolitan Rubber Co., 649 and 651 Broadway. Their spring exhibit is, indeed, a superb one, and should receive the attention of any and all desirous of purchasing first-class garments fashioned in accordance with the very latest designs in fair day wear. An inspection of their extensive display of women's silk and fine wool newmarkets,

wraps, etc., and of men's light weight coats, made expressly for spring and summer wear, will provoke many a flattering word in behalf of their productions.



—Davidson's Improved Oil Atomizer, with metal tubes, is designed for the use of oil, vaseline, fluid cosmoline, alboline or glycerine. The cap is so constructed that the spray can be

turned in any direction without changing the cap. The tube runs upward at a slight angle, so that the moment the air pressure of air is stopped, the fluid runs back into the reservoir, which is situated above the bottle, and from thence into the bottle, thereby avoiding the soiling of the

clothes, etc., which is such a common objection to most all oil atomizers. The cap or cover of the reservoir is made with the same screw thread as the bottle cap, so that in travelling, the reservoir cap can be screwed on the bottle and the fluid kept from escaping. The metal parts are nickel-plated and the whole instrument is finished in the best possible manner.

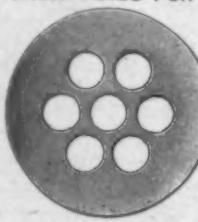
—In cushion tires for bicycles, which have grown so popular in public favor, there have been found some features which were susceptible of improvement.

The Pneumatic, very good, indeed, requires constant care to maintain it to a proper tension, while the ordinary one-half inch hole lacks proper resisting qualities to sustain the rider's weight. The result in either case is a constant tendency to flattening which, in turn reduces the ease of the rider, and promotes liability to the cutting and rupture of the tire. On the other hand, a solid rubber tire has very little resiliency.

The tire represented in the cuts seems to be a happy compromise. It has the elasticity and life of the pneumatic tire, as it regains its form readily, and should it happen to get punctured it makes little difference, as it has numerous holes, and its walls are substantial.

A patent has been applied for the Web centre portion of the tire, and its claims of superiority are meeting with great favor. It is sold by the Bunker & Campbell Co., Limited, 1786 Broadway, New York.

—It may strike the casual observer that to be effective a description of a water bottle should come out early in the fall in order to catch the winter trade; it is, however, surprising how many of these goods are sold all the year around, particularly the flannel covered bottle. We illustrate one of the best makes of flannel covered water bottles, with the most improved water-tight screw top. The best of rubber is used in its manufacture, and the utmost care taken in the cementing and reinforcing the seams and neck so that there is no possibility of leakage. For sale by the Whitney Glass Works, 342 Washington Street, Boston.



—It has come to be acknowledged that a wool boot worn with a lumberman's overshoe is the proper thing for foot wear in the woods. No style of clothing for the feet is at once so comfortable, warm and easy on the feet for the man who works all day long in the deep snow. We illustrate above the Mishawaka Knit Boot, for which a great deal is claimed. It is all knit, shrunken



and fulled, and made absolutely moth proof. The company manufacturing it have arranged with the Woonsocket and Wales-Goodyear Rubber Companies to make its lumberman's overshoes over lasts especially designed to fit this knit boot. For sale by Norman Waite & Son, 127 Summer Street, Boston, who are the General Eastern Agents for these goods.

—The New Brunswick Rubber Co., who claim that they are pioneers in lawn tennis, yachting and gymnasium shoes, are placing upon the market their new lines, "New Brunswick," "Essex" and "Norfolk," in various designs and colors. Charles J. Osborn, lately with the American Rubber Company, has been appointed sales agent for New York, and the New England States.

—The Good Luck Sole is made of the best rubber and being flexible, is easily conformed to any shape or style of shoe. It prevents slipping and so displaces ice creepers. It lifts the wearer half an inch from the ground. It covers only a small portion of the shoe sole, and lets the air circulate under the foot, thus preventing perspiration and keeping the foot dry and warm. It is put on old shoes in place of a half-sole, and out-wears two leather soles. Placed on a new shoe, it keeps it always in shape, and preserves the shoe from a great deal of



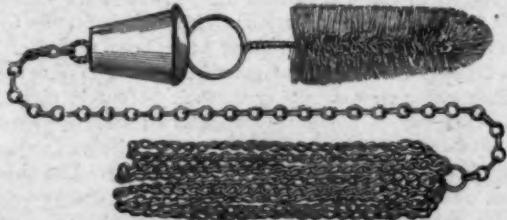
wear. For indoor wear, it is the most desirable thing that can be found. For roofers and electricians, for clerks or any one standing on the feet all day, it is specially fitted. For policemen and mail carriers, and all people who have much walking to do, it is acknowledged to be par excellence. For school children especially, it is unexcelled by anything, saving 50 per cent. in wear, and is noiseless in the school-room. Fits as well on spring heels as on others. For prices and discounts address E. C. Critchlow & Co., Meadville, Penn.

—Among the many uses of rubber, is its application as a cover or shield to the circumference of valve wheels, water combinations and gauge cocks. It consists in stretching a tire of rubber over the periphery of the wheel, and if the wheel be hot, the rubber will gradually become adhesive, and not slip. Cement can be used to make the attachment on cold wheels, of course it can be readily removed when worn out. The improvement allows of the handling of the wheel without burning the hand; also the accurate seating of the valve if the hands be wet, as in

this case they will not slip on rubber. It is not at all expensive and is manufactured by Jenkins Bros., 71 John Street, New York.

—The two cuts here shown represents Dr. Farr's "Automatic Distendor and Irrigator." When closed, the Distendor may be easily inserted a proper distance. With each instrument is a hard rubber syringe pipe, to be attached to any ordinary bulb syringe. The pipe is made tapering, with nine holes through which the fluid or liquid is thrown in different directions. The pipe is inserted into the Distendor (as shown in the Cut) when the instrument is thrown open by the act of inserting the pipe, thus dilating and taking the folds out of the walls to any extent desired, and allowing the fluid to be thrown upon and cleansing every part perfectly. Every physician knows the value of such an instrument. It is made of spring wire, nickel-plated, very fine and durable. Every physician should have one, as there is no article more needed in practice than this simple and valuable instrument. For sale by the Farr Manufacturing Co., Geo. H. Appleton, Treasurer, 266 Washington Street, Boston, Mass.

—The Excelsior bottle cleaner is an appliance that is already quite popular among sellers of general druggist sundries. The cut appended so well illustrates it that it is hardly worth while giving it a detailed description. The rubber stopple fits in the neck of the bottle, and the little mat of chains when shaken up and down in the bottle reaches every part of it and effectu-



ally cleanses it; the brush on the other end of the stopple is a further help in cleansing, particularly in the neck of the bottler; it is highly endorsed by physicians and is a very popular seller among druggists. Manufactured by W. D. Butz, Norristown, Penn., and for sale by the Whitney Glass Works, 342 Washington Street, Boston.

EDITOR INDIA RUBBER WORLD—I noticed in your last a description of a rubber pant guard, and have been wondering since then if it would be of any use to me in my business; can you get me a sample of it, or can't you put in a cut illustrating it in your paper? Very truly, TAILOR.

The illustration that should have gone with the description of Bailey's Rubber Pant Guard was unfortunately omitted

last month; we give it herewith and very willingly endorse it as being something that our friend in the tailoring business would find very useful. Will also forward him a sample. This guard, by the way, is for sale by C. J. Bailey & Co., Boylston Street, Boston, Mass.

—There is a certain class who, in spite of everything, are daily growing round shouldered; this applies to ladies just as emphatically as to gentlemen. To overcome this some sort of daily physical exercise is almost a necessity. The little Giant Health Exerciser, if used, can, without question, not only remedy much of this trouble but vastly increase the general health of the user. It is very simple in construction, so arranged that the weakest muscled person can use it without danger of injury. It consists simply of two wooden balls so made as to be easily grasped in the palm of the hands; joined by an elastic rubber cord, over which is drawn an elastic rubber tube. Manufactured by the Elastic Tip Co., 157 Washington Street, Boston, Mass.



—The Peerless Rubber Co. has lately removed to 15 Murray Street, New York. The mills at New Durham, N. J., are running nights, and employ 130 hands. The company has lately introduced a self-inflating mat for use in fire department houses. It is generally known that firemen disdain the stairs in cases of alarm, preferring to slide down the pole landing on a mat, of which there are several designs. The New York, St. Louis and Chicago departments have adopted that of the "Peerless." Some excellent air-brake hose is also being put on the market. It is tested for 800 pounds, is guaranteed for two years, and has all the qualities of a superior hose.

—A new syringe that is taking with the trade remarkably well is what is known as the Royal No. 23; its chief excellencies are that in place of a metal sinker which may contain lead, this has a soft rubber sinker; therefore no metal comes in contact with



the liquid. It has few valves; has hard rubber slip pipes and hard rubber fittings. It is packed in a neat rubber wooden box, and manufactured by the Tyer Rubber Co., of Andover Mass.

—The Cleveland Rubber Co., believing that foot-ball as a national game is coming into greater prominence this year than ever before, and realizing the demand for a better article than

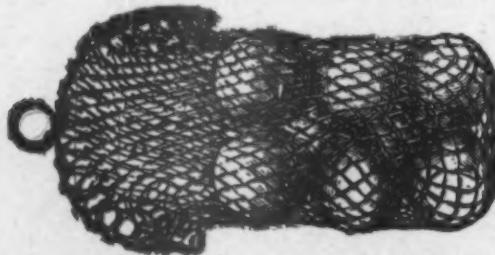


the majority of balls now upon the market, have given this subject careful attention. The result is that they are now prepared to offer the trade a ball which for strength, durability and finish is not excelled.

An article of new goods in the druggist sundry line that has gone pretty generally over the country in a very brief space of time, is something that bears the cheerful name of Babies Delight No. 5. It is the nipple and teething ring combined; made of the best quality of black rubber; is moulded so as to be hollow throughout, thus making it exceedingly soft and pliable. The cut accompanying this describes it better even than words can, and when one adds that it is called the Children's Pacifier, the whole story is told. Manufactured by the Davol Rubber Co., Providence, R. I.

—The Wales Goodyear Co. is placing on the market a black tennis shoe, which is gotten up in a tasteful way, and is a good seller. For next season they are about to put out a cheap shoe, called the New York. The same company have lately issued price lists for tennis shoes, each being printed on cloth, like that used in the piece of footwear it is quoting. By them it is to be noticed that Champions are to be sold at 41@50c. and Wales, which have a tip and a leather inner-sole, at 50@67½c.

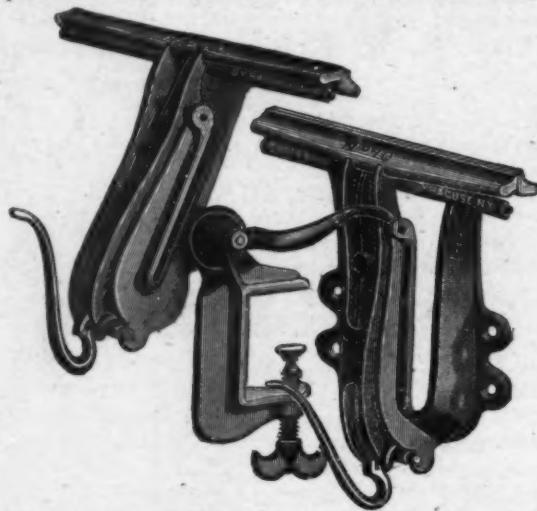
—Early last season we took occasion to say a word describing the tennis ball which Wright & Ditson handle. Since then the ball has gone on increasing in popularity, and were one to tell the amount of these goods that are sold from this single house it would surely be thought a fish story. We have in our hands facsimiles of the certificates of readoption from the



United States Lawn Tennis Association, from the Intercollegiate Lawn Tennis Association, and also from the Southern Lawn Tennis Association. These three letters carry more weight than any amount of recommendation could possibly accomplish. These goods are manufactured by Wright & Ditson, Boston, Mass.

—A fountain pen lately invented by M. W. Moore, of Springfield, Mass., is represented as a decided improvement over the pens now in use, its principal difference being that it may be placed in the pocket in any position and the ink will not leak out. It has a feeder leading from the upper barrel, unlike others in that its groove is so arranged that air may enter through the side. To prevent a too free flow of the ink there is a small rubber valve at the mouth of the feeder, which may be raised or lowered according to the density of the fluid used. It contains no air passages at the top of the barrel. Mr. I. F. Chase, the purchaser of the patent, intends to manufacture the article in Springfield for the present, but will have necessary rubber material furnished by a Boston firm.

—Of all the excruciating noises that can possibly be imagined, saw filing is certainly the worst, and to many it is an agony that cannot be borne. While saw filing cannot very well be dispensed with, we are glad to learn that hereafter the peculiar grating sound is no longer a necessity to the operation. E. C. Stearns & Co., Syracuse, N. Y., have recently made an improvement in their well-known Saw Vises, which consists in



the addition of a third jaw faced with solid rubber. This jaw is pressed against the side of the saw, under and parallel with the metal jaws, effectually reducing the noise during the process of filing. It is brought into position after the saw has been gripped by the metal jaws, the same lever operating them, having a cam which operates the rubber jaw when the lever is pushed home.

—The cushion tire on bicycles, which has become very popular, adds largely to the demand for rubber, and in the march towards luxuriant living, has stimulated its application to carriage wheels. Some importations have been made for New York dealers, and prominent manufacturers are studying the question with a view of adding to their output in this direction. One way of doing this work is to weld a groove or channel on the circumference of the wheel, into which the rubber is drawn, and which holds it very firmly. The grooved pieces are electro-welded, and the whole affair is very substantial. Another is to rivet layers of rubber to the tire, and this plan allows of the use of an inferior quality of rubber. This luxury starts in high for those who must have it, \$100 being the price for a set with renewals once a year at \$30. The bicycle man has got to the point where he throws in the cushion, and does not see ruin ahead in so doing. The carriage man will eventually learn a part of the lesson.



HENRY GEORGE TYER.

Pioneers of the Rubber Trade.

HENRY GEORGE TYER was born in Hackney, London, England, February 23, 1812. His boyhood and youth were spent in the land of his birth, and he received a liberal education, as beffited his station in life. When the rubber business was in its infancy he became much interested in it, and coming to this country settled in New Jersey, where he connected himself with Horace H. Day. With a factory at his disposal he at once began to investigate, experiment and to invent. He was of the greatest advantage to Mr. Day, superintending his factory, evolving new means of working the stubborn gum that was then but little understood, and by his knowledge of business laws greatly helping his partner in his famous law-suits.

Mr. Tyer, although the born English gentleman, was truly American in his sympathies, and was still more remarkable in his fertility of invention. Of course to-day, when the business is large and well understood, many of his discoveries have been outgrown, but a number still survive that are sufficient to make his reputation enduring. One of the first of his patents was a process for rubber thread cutting (patented in 1844 and again in 1845) that was very successful. Soon after this, his attention being called to the faults of the old fashioned white compounds, he began to experiment with oxide of zinc, and in a little time had succeeded in making a beautiful and durable white rubber. A patent for this was granted him January 30, 1849, which was reissued August 7 of the same year. Engrossed by other experiments and the cares of business, he did not value this very highly and sold it for an inconsiderable amount. When the time for the extension of the patent arrived he did not take pains to notify the patent office in time, and therefore the extension was lost to him. Very soon after this white rubber began to be recognized as of great value in the manufacture of druggists' sundries, and although Mr. Tyer was one of the most successful manufacturers of goods of this kind, he did not reap the full reward that in all justice was due him as its inventor.

In March of 1855 he invented and patented a process for making a rubber shoe which was known as a "Compo" shoe, and which he at once began to manufacture, locating his factory in Massachusetts. He coined the word *compo* to get rid of the ceaseless questionings of those who wished to know what the goods were made of.

His attention being called to the fact that at that time much of the goring made by rubber thread processes was defective, he began to work upon a fabric that should be free from such faults. He took out two patents in 1855 and one in 1856 for a Congress shoe goring made without rubber threads that was known as "Diagonal Woollen Goring" and which met with instant favor. The only feature about the invention that prevented the general introduction of the goods was the high cost of production. A year later Mr. Tyer patented the well-known Congress Arctic overshoe, using the Diagonal woollen goring unvulcanized in its manufacture. This patent he sold to the Wales-Goodyear Co., of Naugatuck, Conn., who were ex-

tremely successful in introducing the arctic very widely. Mr. Tyer using machinery that he himself designed, manufactured the goring at his Massachusetts factory and shipped it to Connecticut in the roll, where it was cut in strips, incorporated in the shoe and vulcanized with it.

In 1866 he began the manufacture of druggists' rubber goods in Andover, Mass., under his own name. Ten years later he organized the Tyer Rubber Co., of which he was the president.

Mr. Tyer was a man of dignified presence, with an old-school courtesy pervading word and deed; was a delightful *raconteur*, and a prince among entertainers. Although conservative in business, he was always willing to examine anything new in his line, and if he did not adopt it, often by suggestion and recommendation helped on to success what otherwise might have been complete failure. He died in Andover in July, 1880.

A Hack Writer's Description of Rubber Working.

IN the "Wonderland of Work," an English book designed to teach young folks valuable facts about various lines of manufacture, the following unique description of the rubber business appears:

A great heap of pieces of "rubber" is mixed up with several other things, especially *white-lead*; then these are *melted* together and rolled into sheets of different thickness, which are not at all elastic, but are more like layers of putty than anything else. Yet this is the stuff that presently will become changed into toys of all sorts and kinds—some of it the vulcanized balls which will bounce so finely and beat all other kinds of balls in the market.

But we were watching the doll-making, and observed that, like the workers of Sonneberg, this man uses a mould, only instead of being of *papier-mâché*, this one is of iron, and in two pieces, dividing the doll from side to side. These two sides are laid on the table, and he takes up two sheets of the prepared putty-like stuff, and lays them inside the moulds, poking and pulling it to make them fill the ins and outs of the hollow moulds; then he claps the two halves one on the other, and screws them tightly together, passing on and repeating the operation until he has filled some hundred of iron cases in the same manner, which is soon done by his experienced hands. The next proceeding is to place them all in a vulcanizing bath; this is a large close vessel filled with sulphur and other things, where he leaves them to cook for some hours according to the size and sort of toy they contain. When he considers them ready, he comes and turns them all out of their iron cases, and we see a set of dolls' heads, dolls, animals and other things, all complete, except for a little finishing-up and trimming round the edges where the joining of the moulds has left a seam; they are quite soft and elastic now, the balls can be squeezed and the dolls doubled up; a little paint is all that is required to make them presentable to young customers.

Gutta-percha playthings are fashioned somewhat differently. They are cheaper and showy, not as neat as the India-rubber ones, but sooner made; for gutta-percha requires merely to be soaked in hot water and moulded, so the paste is rolled out in big sheets, which are warmed, pressed in moulds, and dropped into cold water; then the toys fall out, complete and ready for the painter's brush, which daubs them over usually with patches of red, white and yellow, as finer work would be wasted on this material.

It is Time They Knew Better.

THERE is no question but there is a wide-spread ignorance concerning the general rubber business among people of all classes. It has often been remarked in these columns that the belief that there is in existence a rubber trust is still strongly entrenched, not only in the minds of the readers, but of the writers of newspapers as well. The paragrapher is in a measure the unwitting cause of much damage to the rubber business, because he talks of things that he knows nothing about and gives information that is most misleading. For example, a writer in the Philadelphia *Inquirer* fires this broadside into the ranks of the soft rubber trade :

There is nothing that an unscrupulous salesman can outwit the unwary purchaser in as easily as in rubber. All rubber, unless it is the hard vulcanized kind used years ago for jewelry, becomes disintegrated or spoiled by age. It is a vegetable matter and this change cannot be prevented, at least no process has been discovered yet by which it has been. Rubber overshoes, gossamers, waterproofs, or any goods that have been long manufactured become perfectly useless and at a slight cause will fall to pieces. A new pair of overshoes fresh from the factory will last three times as long as one of last year's stock. Old gossamer waterproofs fall to pieces sometimes at the touch. This old rubber, it is said, is bought up at the shops and manufactured over, but it cannot be made durable. At best it is only shoddy of a detestable kind.

The fact that this is nonsense will not prevent a host of readers from believing it to be gospel. The Philadelphia ladies will be anxious all next winter to get rubbers "just baked."

Another case in point comes from the *Journal*, published in La Salle, Ill. In an article on the "Brazilian Trade" a wise writer says profoundly :

Our total imports from Brazil amount to \$60,000,000, of which \$9,000,000 worth is the strong, crude black rubber of commerce, which our manufacturers mix with many times its own bulk of white lead and arsenic and other harmless ingredients, and then make it into the ravishingly beautiful articles of rubber that go to form so many of our necessities of life.

Reading this article mothers will believe that white rubber is colored with arsenic or white lead, and will let it alone. There is in a statement like the above a damage done to the general white rubber trade that may be larger than at first sight appears possible. Of course there is no redress. Little by little the people must be educated in rubber topics. They must know so much about rubber that the question of arsenic entering into its composition will be absurd.

One more quotation and the polls are closed. The *New Nation*, Edward Bellamy's paper, says :

It is understood that the rubber jobbers of the country are circulating a petition urging a combination of the factories into a trust in order to support rates at a uniform figure. There are fourteen rubber factories in the United States, all but two of which are east of Philadelphia and the major part of them are situated in New England.

Do you mean that there are only fourteen rubber mills in the country, Mr. Bellamy? Counting all kinds there

are hundreds. Or do you mean rubber boot and shoe factories? Even there you are weak, for the number runs over 20; and no wise jobber to-day spends any time in talking "Trust." There's nothing in it.

Rubber Cultivation in Trinidad and the West Indies.

A RECENT number of the Trinidad Council Paper contains some valuable records of the results obtained in the experiments at the botanical garden at Port of Spain, among which the following statements are worthy of note. The *Castilloa elastica*, the great rubber tree of Central America and of the northwestern parts of South America, is in great demand for cultivation in Trinidad. They have been found to thrive well and have produced seed in fairly large quantities. They are regarded as especially well suited to cultivation, and as they yield rubber rather freely all the year round they are considered an extremely valuable rubber-producing plant. It has, however, proved inexpedient to plant the *Castilloa* in the open. Those exposed to the sun in the dry season become stunted, while those growing under shade are in a flourishing state, and this feature of their growth is also maintained in the various positions in which it has been recently planted, both in Trinidad and Tobago. The East Indian rubber, *Ficus elastica*, is also grown in Trinidad, and proves a much more hardy tree than the *Castilloa*. It attains a large size in the open and can be readily propagated from cuttings. The rubber it produces is said to be of a good quality.

A *Manihot* growing in the botanical garden in Granada is doing finely. It is now four years old and has attained a height of 25 feet, and will be tapped next year. This, it may be remarked, is a much slower growth than is usual in Ceylon, where this tree is now being cultivated to a considerable extent. This circumstance may be due to the greater amount of moisture at Granada, a condition unfavorable to its best development, but even the result obtained in this instance is of considerable importance as indicating the possibilities of adaptability to different climates which this tree possesses. The *Manihot*, it will be remembered, is the source of the so-called "Ceará" rubber.

Rubber Trade in the South.

THE rubber trade in the South has been one of steady development for the past two or three years, and is chiefly in the mechanical line. As one goes South from Baltimore and Cincinnati, he finds a preponderance of lawns and front plats, which during the long summer season are watered morning and evening. This makes every householder of the middle class an owner of a reel of hose. Manufacturers are increasing rapidly, and the demand for belting and packing is thus stimulated. Druggists specialties are in fair demand, but outside of the sportsman there is little demand for boots, and shoes are slow of sale. The tennis shoe may have a run this season, as it is as well fitted for use there as in the North. Rubber shoes are spoken of as "gums," a name that sounds oddly to the Northern tympanum.

Current Gleanings.

BY LIGHTNING ARRESTER.

THE recent heavy storms have done a good deal to illustrate the value of subways and underground wires. Underground wires have ills of their own no doubt, but at least they have the great advantage of being unaffected by snow and wind storms. Of course in systems like the telephone and electric light service of large cities it is impossible for everything to be underground, as the wires must come to the surface and above it somewhere, in order to distribute to the instruments and lamps. Therefore, no system is wholly impervious to a storm of unusual violence, and this was clearly exemplified in New York lately when several heavy poles which served as distributing points for underground cables, the cables being run up the poles from the subways, were blown down, cables and all, in the severe storm which wrought such havoc among the wires last January.

In spite of the widespread damage caused by that storm the electric light companies escaped remarkably well. Although they fought against the subways so strenuously a few years ago they must have felt very thankful that so many of their wires were reposing safely underground when the snow and the blow came. If the electric light wires had been overhead in the same number and the same condition on the occasion referred to as they were, say two years ago, it is pretty safe to say that the storm would have left them all on the ground and that the city would have been in the dark for a month or more, while the companies were engaged in reconstructing their circuits.

According to the latest resolutions of the Board of Electrical Control, it would seem that the mayor is bent on getting the wires that still remain overhead put underground in short order. Everything is to be cleared up between the Battery and Fifty-ninth Street by June 1st. The mayor himself introduced this drastic resolution and once more revealed his ignorance of matters electrical by making no allowance for the distributing points previously referred to, which are a necessity in all underground systems. Subway matters in New York are getting more mixed up every day. The Board of Electrical Control falls lower and lower as time goes on and is never spoken of in scientific circles except with derision and contempt. It is the most inconsequent body of all those that rule over this benighted city, and that is saying a good deal. As an instance of this may be mentioned the case of Lineman Kopp, who was killed last October on an electric light pole at Broadway and Thirty-fifth Street. Meetings of the board were postponed several times because the mayor wished to await the verdict of the coroner's jury. The inquest was held and the verdict gave the mayor an excellent opportunity, but no meeting of the board took place until months after the inquest, and no further notice was taken of the death of Lineman Kopp.

The thirteenth semi-annual convention of the National Electric Light Association was held at Providence, last month and was in all respects a great success. The attendance was very large, about 450 delegates being present, a number of very interesting papers were read, and the exhibits were more numerous and representative of every branch of the industry than has ever before been the case. The insulated wire manufacturers were of course out in full strength, Kerite, Okonite, Grimshaw, Safety, Standard Underground, Roeblings, American Electrical Works, Simplex, Bishop and others were strongly represented both in the abstract, in the shape of handsome

arrays of samples, and in the concrete in the shape of still handsomer troops of talkers and workers. A new firm, the Crescent Insulated Wire and Cable Co. of Trenton, N. J., was represented by C. Edward Murray, president, and Mr. Thos. D. Reed, manager. The Crescent company is making a new style of insulation, having the control of a process recently mentioned in these columns for weaving a glass insulation over the conductors. Special machinery has recently been put in at the works of the company at Trenton for this purpose and active work will soon be in full swing.

The Committee on Underground Conduits and Conductors, as usual, made a very poor showing. The usual number of excuses were made for the slimness of the report, all amounting to the mortifying admission that there was really no information at all to communicate, with the exception of a report made by the Chicago Arc-Light and Power Company. This company has in all 151 miles of "high-tension cable" in operation, which is a very good showing. Better still, there were only 31 cases of "trouble" on underground cables in the year 1890. The causes of trouble were divided as follows: Result of mechanical injury, 18. Defective joints, 4. Defective insulation, 2. Other burn-outs, cause not accurately determined, 7. During the year 1890, 33.8 miles of underground conductors were laid by this company, and up to the end of the year there was only one case of trouble in these 33.8 miles, which was caused by a defective joint. The rebates during the year for defective service amounted to one-third of one per cent. of the gross earnings, and it was estimated that possibly one-third of those rebates were attributable to circuit troubles. The longest underground circuit is $7\frac{1}{2}$ miles from pole to pole, and carries current at an electromotive force of 2500 volts. The company states that the blizzards have in no way affected the service. This is an extremely interesting report, and makes an excellent showing for underground conductors. It is a thousand pities that the committee could not manage to obtain reports from a number of companies operating underground wires, as the comparative results would have been of the greatest interest and value.

Interior conduits for wiring buildings are quite the rage nowadays, and they certainly offer many advantages on the side of safety and flexibility of the wiring. Mr. Augustus Noll read a suggestive little paper before the Providence Convention, entitled "Electric Light Wiring from a Mechanical Standpoint," in which he sketched the improvements that have been introduced in methods of wiring and the various accessories, and gave it as his opinion that a wiring system free from objectionable features and combining accessibility with freedom from leakage is to be attained by using "a high grade moisture-proof wire, with a system of race-ways or conduits and a complete line of 'fishing' or junction boxes." This is practically the interior conduit system already well known with the elimination of the bad practice of using lightly insulated wire and depending upon the conduits for insulation, a practice which I believe the original company has already abandoned. Mr. Noll advocates the use of the same grade of insulated wire in the conduits as would be employed were the wires simply run in mouldings in the ordinary manner, and there can be no doubt as to the wisdom of this plan.

The New York Insulated Wire Company will shortly place upon the market a complete system of wire ducts for the interior wiring of buildings for electric light and power purposes. These tubes or ducts are to be known as "Vulcanoid Electric

Wire Ducts." The material is said to have high insulating properties, and at the same time is waterproof and non-inflammable. The material is pliable and tough and is given a smooth finish, which of course greatly facilitates the operations of drawing in wires; it is not affected by extremes of heat and cold, and is not acted upon chemically by substances likely to be met with in buildings, such as lime, plaster, etc. The compound and tubes are the invention of Mr. George H. Meeker, and the system of arranging the tubes and junction boxes has been elaborated by Mr. Augustus Noll.

Another new thing in the interior conduit line has been brought out by Mr. Alex. P. Wright, of Boston. Mr. Wright has produced a tube which is pliable, non-conducting, waterproof, and practically non-inflammable by employing a flexible glass tube, which is surrounded by a woven jacket of canvas, this outer covering as an additional precaution being soaked in an insulating compound. Exactly how the glass tube is made flexible does not appear, but that it is so was clearly demonstrated at Providence, where a section of the conduit was shown with the wire of a lighting circuit passing through it, the tube being bent twice at right angles and immersed in water, thus showing at the same time the flexibility of the conduit and its waterproof qualities. This latest addition to the list of interior conduits is manufactured by the American Circular Loom Company, of Boston, whose woven "Canvas-Jacket" insulated wire has already been described in these columns.

Preserving Rubber Tubing.

IT appears that rubber acts differently in Germany from what it does in the United States, for we have curious information from German scientists with regard to it. For example, one advises that rubber tubing be soaked in paraffine to make it lasting. He further says that he has learned that rubber tubing will never become brittle if kept under water. His plan was to lay it in the water, which was often changed, and even the thickest and stiffest tubes remain soft and pliable without any perceptible diminution of elasticity, although in the water the tube experienced a great change in color, while upon its cut ends it appeared greasy and bleached. As a rule, rubber tubing cannot very handily be kept under water, in fact, as it is made in this country there is very little of it that does become hard. Our German friend does not state whether the tubing that he experimented upon was white, black or red. We have a suspicion that it was the latter color and that in the process of vulcanization it had been a trifle overcured. If this is the case, rather than keep it under water to prevent it from becoming brittle, would it not be better to cure it more carefully and have it right in the beginning?

Death of O. P. Prescott.

M R. O. P. PRESCOTT, senior member of the rubber firm of Prescott Brothers, of Boston, died February 28, at his home in Dorchester, aged 41 years and six months. He was born in South Boston, where he lived many years, and at the age of 18 entered the employ of G. H. Hood & Co., now the Boston Rubber Co. He remained with this firm 13 years and then, about 10 years ago, started in business for himself in partnership with his two younger brothers, John and Charles. The deceased member of the firm was very popular in the trade, and was highly respected for his strict integrity. His associates in the trade are much grieved at losing him while he was in the prime of life. A widow and two children survive him.

The Diminishing Trade in Gutta Percha.

"THE gutta percha business," said an importer the other day, "has fallen into a peculiar rut. There is a good business abroad, but I think it is on the decline, rubber gradually taking its place. In Europe it is used for faucets, beer taps, watering pots, etc., but in this country hard rubber holds sway. At Silverton in England there is a large factory. The Gutta Percha and Rubber Co., of New York, make some acid jars, sheet gutta percha, and other articles, but the demand is limited. When boys, we used to have the gutta percha buttons, and we then made finger rings of them, but that is a lost art. Only about ten tons per year are imported into this country, that being used for cable and cement purposes. The cement men have little factories scattered in country villages, and they make us tired. One of them will appear at Harlem, and he will talk with us all until he gets to the Battery. By that time we are in a state of excitement, jumping to the conclusion that a big buyer has come to our relief. I overhaul the eight baskets that have been drying out on me for over a year, and my neighbor his four baskets, which he has held not quite so long. Others brush up their small lots, and pretty soon we all gravitate together and rig up an impromptu trust on him. Old money bags, as we have sized him up to be, overhauls everything, and after he has dissipated the big price we have put up on him, for we are glad to take pretty nearly cost rather than to lose him, he takes *three* pounds and departs, leaving us to wonder whether the peanut stand on the corner is not our legitimate business after all.

"The cablemen do a little better, but it is close figuring. They take a little red from us for anchorage places, and more white, but as to quotations, no one can keep track. The best, which is worth double that of the next quality, often selling on a par with the next grade, as conditions of trade may happen.

"In Boston they do better, but manufacturers are letting gutta percha slowly pass into oblivion, and if what is going on keeps on the next generation will place it among the articles used by the ancients.

"Why do I stay in the business? Well! It is a good thing, I suppose, that we all have to take a bite out of a sour apple once in a while."

He Got There Just the Same.

A RIVAL'S praise is always as valued as it is unexpected. Mr. J. B. Dillingham, of Boston, agent for the Burton Rocking Grate, tells the following story on this point. It seems he had an exhibit of his shaking grate at a certain important fair and received first prize. After the commencement one of the committee of award found that they had gone out of their territory, and that grate bars belonged to another committee. They therefore apologized and turned the matter over to the proper parties. At the head of this committee was a rival manufacturer, and one whom Mr. Dillingham in his youthful enthusiasm had pressed pretty hard while hustling for business. It was therefore a genuine surprise to him when from the hands of this gentleman he received a medal and diploma giving his grates credit for "superiority of construction and efficiency of shaking arrangement."

HAPPENED IN PENNSYLVANIA.

CLARINDA—What detains Cousin Will so long in the vestibule?

CLARISSA—He's rubbing his gums on the mat.

CLARINDA—Good heavens! Why don't he use a toothbrush?

UNCLE FRED—Permit me to explain. The young man is cleaning his rubbers.—*Pittsburgh Bulletin*.

The Bosworth Pump Governor and Feed Water Regulator.

THE Bosworth Pump Governor (Fig. 1, section) is actuated by two positive forces, one, compressed air, the other, a spiral steel spring; both are certain in their action and easily adjusted to the work required of them. The power of the spring is constant, while that of the air is made to vary from nothing, to double that of the spring. As these forces act in opposition—the spring to open the throttle valve and the air to close it—it is obvious that the spring can be effective only, when the air pressure in the cylinder is less than its own; and that the air can be effective only, when its own pressure exceeds that of the spring; and it will be seen that these conditions are obtained and repeated at regular intervals, according to the work required of the steam pump.

An air pump (not here shown), connected by proper mechanism to the steam pump to be worked by it, pumps air into the cylinder, A, through a pipe connected at D; when sufficient pressure is accumulated therein, the piston, B, which is directly connected by the rod, F, to the throttle valve of the steam pump, is forced downward, thereby compress-

ing the spiral spring on the rod and closing more or less the throttle, and consequently retarding the pump (and with it the air pump). A small passage, G, with adjustable orifice, H, for the escape of air is provided, through which the pressure in the cylinder is gradually reduced, and when the air pressure becomes less than that of the spiral spring, the latter forces the piston upward, thereby opening the throttle more or less, and consequently accelerating the pump (and with it the air pump).

When a regular and uniform speed of the steam pump is required, it can be obtained by modifying the area of the passage, G, by the adjusting nut, J. When once regulated, the steam pump will continue to run without variation, regardless of the changes of steam pressure, or load on the steam pump. Its action is positive and direct, and so sensitive that it controls the steam pump within two strokes in case of accident.

THE BOSWORTH FEED-WATER REGULATOR.

Fig. 2 shows a steam boiler with the Bosworth Feed-Water Regulator in position.

This apparatus consists of the air pump operated by the steam pump, O; the pump governor, K (as above described, except that the orifice H is closed and the escape of air from the cylinder is controlled by a valve operated automatically), and the regulator, R. This regulator has boiler connections in common with the water gage, S, and is interposed between it and the water column, W, conditions which secure the same fluctuations of water level as take place within the boiler, and being outside of it, the water contained is cooled by radiation;

a fact of great importance in this device. The regulator may be described as a half inch brass pipe having a rectangular return-bend, the horizontal legs of which are about 8 inches long and 2 inches apart, all in the same plane. This return-bend is located so that the upper or steam-leg, Q, shall always be filled with steam, while the lower or expansion-leg, P, shall have its horizontal diameter level with the prescribed water line, to be alternately filled with hot steam or cooler water as the latter slightly falls or rises by reason of its evaporation and the prompt supply afforded by this device. Below the expansion-leg is an adjustable steel rod, connected at one end to the upright part of the regulator and at the other end to the lever which controls the valve, in the air pipe leading to the governor.

To understand the automatic operation of the apparatus above described and illustrated, let us suppose that the water in the boiler is at its highest point, at which time the expansion-leg is full of water and the air valve is closed; the pressure in the cylinder has forced the piston down, compressed the spiral spring, closed the throttle and stopped the pump. This condition of things lasts but a moment; evaporation is constantly going on in the boiler and lowering the water which gradually settles out of the expansion-leg, and its place is instantly filled by steam from the steam leg. The live steam being much hotter than the water which it has displaced, expands the pipe, which acts on the lever of the air valve and slightly opens it, thus relieving the pressure in the cylinder of the governor so that the spiral spring may react and open the throttle, by which the pump is started. The action of the pump con-

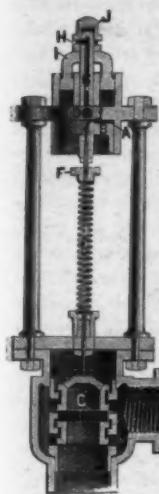


FIG. 1.

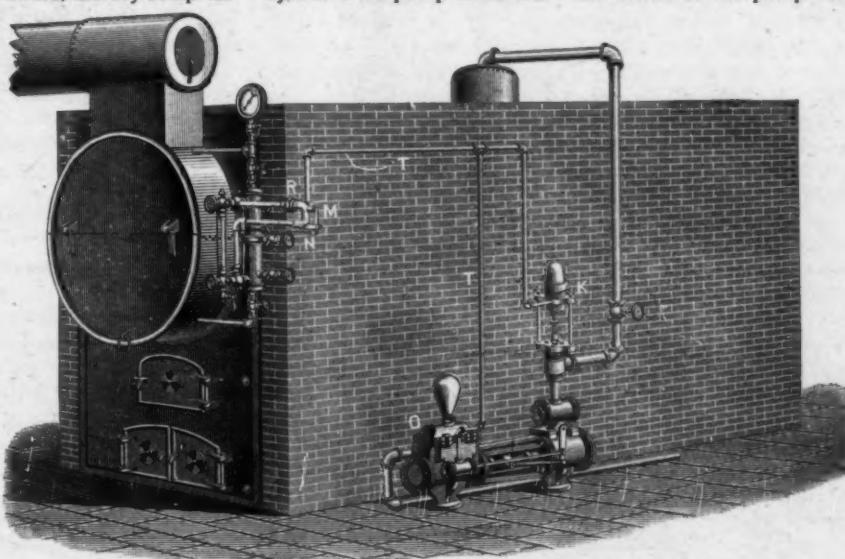


FIG. 2.

tinues until the water is again carried to its highest point, filling again the expansion-leg with cooler water which contracts it and closes the air valve, so that pressure is again accumulated in the cylinder of the governor, by which the piston is forced downward, the spiral spring compressed, the throttle closed and the pump stopped; thus completing one round or alternation, and this automatic action is continued as long as evaporation takes place and power is generated in the boiler. This apparatus is susceptible of very fine adjustment by means of the rod, N, so that the rise and fall of water in the boiler shall not exceed one-fourth inch above or below the prescribed water-line.

Address inquiries relating to these inventions to the Crosby Steam Gage and Valve Co., 93 Oliver Street, Boston, Mass.

Progress in Rubber Boot Making.

THE manufacture of rubber boots and shoes is, in spite of its perfection, but a young industry. To appreciate this one has only to compare it with the manufacture of other kinds of foot wear, notably the ordinary leather shoe worn by the majority of people to-day. The leather shoe business has gone through a great many changes in the last few years; new machinery and new processes have completely revolutionized it. Even the methods of selling the shoe have been changed entirely. To-day the rubber boot and shoe business, in a manufacturing sense, is entering upon one of these eras of change. The business has grown so large, and competition is so keen that manufacturers are straining every nerve to bring about improved processes and new machines that shall decrease the labor and minimize the expense of production. This being the case the experience of the leather shoemen, their mistakes and successes, should point the shortest road to the desired perfection. One could at short notice show many processes in the rubber business that are exceedingly crude. For example, the lack of regular sizes in rubber boots is one that the retailer feels, if nobody else does; for there is no retailer of any account in the country but must carry 25% more stock in order to fit his customers than he could were there a regular gradation of sizes. It may be that the manufacturer will say that this is to his advantage, rather than otherwise. In saying this he would but repeat what the more short-sighted of the leather shoe manufacturers said when the same problem confronted them. The fact of it is, no individual interest can ever for a long time bar genuine progress. To the company, therefore, who first put out a line of exact and regular sizes in rubber boots, will come the gratitude of the retailer, his trade and his dollars. It may be said that this cannot be done; that the ordinary wooden boot tree, no matter how carefully seasoned and accurately made, will in the first heat shrink; and will ever after keep drawing away from its first correct shape. At the end of a year it will be so badly shrunken, the edges will be so chipped off, and its shape so far gone, that it can only be used on "seconds." With this tree, therefore, it is impossible to keep the sizes regular. There is however no necessity of the progressive rubber manufacturer sticking so closely to the ordinary wood tree. There is to-day on the market a metal tree, made of malleable iron, that has exactly the same weight as the ordinary wooden tree, that will last almost indefinitely without any change in shape, and that is bound to be adopted before another year. Its first cost will probably be more than that of the wooden tree; but in the end it will be cheaper. The wooden tree is an expensive, unreliable, troublesome adjunct to the boot room, and the sooner it is gotten rid of the better.

Another Substitute.

SENHOR DA COSTA, a gentleman well known in Portuguese scientific circles, is reported from Goa to have discovered an excellent and abundant substitute for gutta percha. If this is true, it will be good news for the electric telegraph companies. It is the solidified fluid which issues from the Nivolicantem, which grows wild in the Concan district, and is generally planted for hedges. Senhor da Costa states that it is insoluble in water, it softens under heat and hardens in the cold. It receives, moreover, and retains a given moulded shape, can be cast into very thin sheets and is capable of taking the minutest impressions on its surface. Though white when it flows from the tree, in its dried state it is of a chocolate color, closely resembling gutta percha.

How Rubber is Collected.

BEFORE beginning operations on this tree, the man cuts a few lengths of cariso bamboo, in which to catch the milk as it falls from the simple spout he will fix in the side of the tree; or, it may be, he will dig a hole in the earth close to the base of the hole and catch the milk in that. Then the rope he carries is passed around his waist and the bole, to form a loose loop. Having cut two notches which nearly encircle the tree and meet to form a point on the side nearest him, the rubber gatherer sticks a bit of leaf into the junction so formed, and the spout is made. With a dexterous flit, he throws the loop of rope up, braces back in it and walks up a step, makes another V-shaped notch, and repeats the operation until the branches are reached.

By the time the topmost cut is made, the others are bleeding profusely, and a creamy stream is filling the bamboo. When this is nearly full, it is cocked by a wad of leaves, and set aside to wait until others have caught all the milk that will flow from this cutting. Later, the tree will be cut again in like manner, and will be killed by the second operation.

After gathering the sap from a number of trees, the ulero-digs a hole in the ground with his ever ready machete. Then he pounds to shreds between two stones a few pieces of the vine used for coagulating the milk, washes the bruised fibres thoroughly in a panful of water, and wrings out all he can of the juice. With this he sprinkles the sides and bottoms of the pit he dug, then pours into it the milk from the joints of cariso. When all is in, he adds to the white fluid the greenish washings of the vine, and stirs the whole with his hand.

Almost instantly the contents of the pit become a spongy mass, easily compressible and exceedingly elastic. Lifting the sponge from its bed, he squeezes from it the now brown juice, and it is ready to go to market.—*Exchange*.

The Ladies' Home Journal on Rubbers.

THERE is a curious prejudice among many against the over-shoe, and yet the despised rubber is an essential protection against the melting snow and slush of March. The thickest sole of the heaviest walking boot absorbs enough moisture to dampen and chill the feet, and yet nothing is more perilous than sitting in a warm room with rubbers on, excepting going about the ordinary house in slippers. Draughts hug the floor and lie in wait for the unwary. The clinging of wet skirts against the ankles is a fruitful source of aches and pains. Leggings of leather water-proof or rubber will obviate this trouble in a degree, while a skirt of flannel, faced with a rubber band, avoids the danger altogether.

THE *Tribune* of Evansville, Indiana, says: "Since their removal to 203 Upper Second Street, the Evansville Rubber Company have fixed their store up in fine style, and now have two lady clerks to wait on lady customers. This store has become an important new industry in this city. By the way it is worthy of note as showing the efficiency of advertising, to state that THE INDIA RUBBER WORLD, published in New York, exclusively in the interest of the rubber trade, contains an article taken from the *Tribune*, in which we referred to a creeping doll baby that the Evansville Rubber Company displayed in their show window a few weeks. THE INDIA RUBBER WORLD is a bright and exceptionally well edited trade journal, and is always authority on anything pertaining to the rubber business."

A Rubber Shoe Man Interviewed.

THE *Rocky Mountain News*, a live Denver newspaper, publishes an interview with one of our Eastern rubber men, Mr. Geo. T. Allen, of the Candee Rubber Co., which is readable if not exactly accurate.

When asked to explain the manner of transforming raw rubber into goloshes, he said: "How do you suppose it is done?"

"By melting the rubber and running it into moulds," was suggested.

"That is just what 99 out of 100 suppose," he said. "The manufacture of rubber shoes is not very much different from the manufacture of leather ones. They are made on lasts just the same, but instead of being sewed they are cemented. We get most of the raw material from South America. It is about the color of molasses and is of a spongy nature. First it goes through a crushing or rolling process and comes out in rough sheets and looks very much like a cow's hide. Then it is taken into a compounding room where it is mixed with a compound and vulcanized. After that it is cut up into small pieces, according to the parts of shoes which we wish to get, and is afterwards fitted onto lasts by the workmen in the same manner that leather is. How much pure rubber is contained in the manufactured article? About 70 per cent. The best Pará gum costs 95 cents a pound, so you see, rubber boots and shoes cannot be made for nothing. In the smallest rubber shoe made there are about four ounces of pure rubber, and from that to probably four pounds in a pair of rubber boots."

"What do you do with the old rubbers that are bought up?"

"They are ground up, lining and all, into what we call rag carpet, and it is used for insoles. The work is nearly all done by hand and in the factories are employed young children and from that up to men and women. A bootmaker gets 20 cents a pair for making them and a good man can turn out from ten to twelve pairs a day. There are between fifteen and twenty rubber boot and shoe factories in the country with a total capacity of about 150,000 pairs of boots and shoes a day. There are four factories having a capacity of over 20,000 pairs each and one which has a capacity of 40,000 pairs. It is a mystery where they all go to."

A Foreman Surprised.

ON Tuesday evening February 24th, Mr. Richard M. Pearce, foreman of the shoe room of the American Rubber Co., East Cambridge, Mass., was the recipient of a surprise from the employés of his department. At his residence a delegation of ladies and gentlemen numbering about fifty came in upon him unawares, and presented him with a valuable upright writing desk and book case combined, of heavy carved oak, and a large and comfortable easy chair. Mr. Pearce was completely taken back by the unexpected arrivals. A pleasant entertainment of music and refreshments was soon improvised by Mrs. Pearce, and the party tarried for a few hours before they returned home.

AFTER a variety of experiments a leading physician has discovered a manner of using India rubber for healing wounds. His method was to place one end of the strip of rubber upon one lip of the wound, and then stretching the rubber to fasten the other end to the opposite lip. In this way he was enabled to draw the severed parts closely together and the elastic rubber acted continuously to hold them there. The sheets of rubber used were quite similar to rubber dam, and were painted over with a thin gutta percha cement.

The Biggest Biscuit Yet.

THE largest biscuit ever brought from Pará to this country is on exhibition in the wareroom windows of the Gutta Percha and Rubber Mfg. Co., on Warren Street, New York. The rubber is "up river" and weighs over 1000 pounds, the largest heretofore weighing only about 300 pounds. It cost delivered \$1010.00. On either face of its sides are marked:

BOMGIVAL
RAYMDOGA.

An inscription that is not understood in this country. The history of this face is as yet unknown but correspondence has opened with the Pará shipper to learn something of it if possible. Biscuits weighing about 100 pounds are the usual ones of commerce. They are about 18 inches in their longest diameter, the shape being elliptical. The mode of handling the milk makes speculation with regard to this large biscuit interesting. The milk collected in jars is placed on the end of a stick, which is turned by the hand of a native rapidly over a dense smoke, layer after layer being dried on successively. The pole hole in this biscuit is large and it must have taken the efforts of quite a number of the natives to have manipulated it, and some rude support must have been used for this purpose. It may be an indication that gathering on the Amazon is in a process of slow evolution. Well-posted experts have claimed that the process of hand formation could readily be supplanted by a volume of steam or heated air, or evaporation by means of boiling water.

Rubber in the Bermudas.

M. R. O. H. CURTIS, of the Omaha Rubber Co., who is at present enjoying a respite in the Bermudas, writes us under recent date as follows:

We had a very pleasant passage here as far as weather was concerned, but the sea was rough enough to affect the appetite of nearly all our passengers. We found the weather here very spring like, but have had several chilly, rainy disagreeable days since. It would be nice rubber weather in the States, though here is of less importance. Flowers of all kinds are in great abundance, the banana and other fruits are ripe and very nice. It seems a very pleasant change in weather from that now in the States.

There are several large rubber trees here, the largest of which has a trunk at the ground more than six feet in diameter, but it is divided into many branches almost at once, and these reach out in all directions seventy or eighty feet, thus shading a large area. No attempt to gather the sap has been made.

I find there are many things in rubber goods sold here, all or nearly all being of English make. Chief among the variety of goods are macintoshes of all styles and grades, cloth surface ladies' garments, buggy and other blankets, lawn tennis and other shoes and druggists' sundries. Very little in the way of mechanical goods are used. I see no real reason why many rubber goods made by our factories in the States could not be sold here if the effort was made.

Since I have been here I have had the misfortune to be sick most of the time, owing, I think, to the change of climate and the poor state of my health when I came, but I hope now to pick up and gain much every day.

O. H. CURTIS.

Working Up in a Rubber Factory.

BY A FORMER SUPERINTENDENT.

HOW well I remember the time when the manufacturers began to wake up to the fact that as rubber advanced in price it was practical for them not only to save the scraps of unvulcanized stock, and to utilize them, but to devise some method for recovering vulcanized scraps. We had by this time learned quite well how to grind up mechanical rubber, such as car springs and buffers, and to use them again in certain kinds of mould work. Rubber stoppers, particularly, were something in which we could load a great amount of this vulcanized rubber dust. There were, however, some valuable stocks that we had not learned to treat successfully. For example, in one factory that I was quite familiar with, the superintendent for years had stored the scraps of cloth and rubber in huge sheds until he had hundreds of tons of them. The stock on them was excellent, it was of Pará rubber and had never been vulcanized, but at the stage the business was in at that time, it was impossible to utilize this vast amount of stock. To be sure, some of it could be ground up with the cloth and used in various kinds of rag stock, could be worked into packing, and some of it had been made into rubber buckets, but it did not work successfully, and particularly where the scraps contained wool the stock almost invariably blistered. This we believed to be caused by the oil that remained in the wool, which formed a gas under the influence of heat during vulcanization.

This great mass of unvulcanized material, holding thousands of pounds of rubber was something that fascinated me exceedingly, and I used to go up to my friend's mill, and, standing in the sheds, look down through them and wonder what the best way was to recover this rubber. At length a scheme occurred to me, and going into the machine shop in my own factory, I built a little apparatus and tried my experiment on a small scale. As it worked successfully, I was very much delighted, and at once went to the owner of the mill and told what I had in hand. He listened attentively and then said :

"I have a piece of stock that I believe is made in just the way that you describe. Now, let us look at it," saying which he took from his desk a piece of black, unvulcanized rubber, quite soft and gummy, but entirely free from fibre. It had a strange smell of naphtha, and I was almost sure that the process of recovering must be somewhat after my plan.

"Do you know where this was done?" I asked.

"Yes; in the town of B—," was the reply.

"Can you give me a few days to go down there and see the man who did it?" I inquired.

"Yes, if you think it worth while," was his reply.

Accordingly, a day or two later I took train for the town of B—, and as it was something of a journey, did not arrive there until the next morning, when, after a hasty breakfast at a railroad restaurant, I started in search of the mill where this sort of work was done. I was not long in finding it, and was not all sorry to discover that I had reached the plant before the owner had appeared on the

scene. A workman, who acknowledged that he was not the foreman, was in charge and repelled all my advances until I presented him with a couple of choice cigars, which he accepted with pleasure, and thawed out considerably. He, however, did not light up in there, nor would he allow me too, as the office, even, was full of the fumes of benzine. As he became more chatty, I expressed a desire to have a look at the plant, and he, after a moment of demurring, told me to come along. Going from the office we entered a large open room, in which were the most curious machines for a rubber plant that I had ever seen. The first of these was a cylinder with iron points on its circumference, which, revolving very rapidly, tore the masses of unvulcanized scrap to pieces,—not a very easy job, either. Once torn to pieces, these rubber covered rags were placed in a vat containing naphtha and surrounded by steam pipes where very little heat was applied, which warmed the naphtha, caused it to penetrate the rubber more quickly and put it in solution. When the rubber rags were well soaked, the whole mass was taken out and put in a centrifugal machine, which, running at a high rate of speed, threw out every drop of liquid, which was nothing more nor less than the benzine, black with rubber compound. This thick syrup was then put in an evaporator, the naphtha driven off and into a condensing chamber, where it was all recovered, and the rubber left a sticky mass in the bottom of the vat. This was then taken out in slabs, washed on an ordinary washer, compounded with a little white earth that looked like whiting but felt like magnesia, and the gum was ready for use.

I saw at once that the proprietor of this mill had the start of me by some time. My system was his exactly, except that I probably should not have thought of using the centrifugal. Instead, therefore, of pursuing my scheme, I let it drop then and there, waited until the proprietor came in, had a pleasant chat with him, told him of the vast collection of rubber rags at my friend's mill, accepted an invitation from him to look over his own mill, which I did to the amazement of the man who had shown me over it before, and taking the next train, returned home.

A few weeks after my return home the gentleman who owned this novel process for recovering unvulcanized scrap appeared on the scene wishing to purchase the contents of the sheds. He, however, was not received with much joy by the proprietor of the factory, for his superintendent had in the meantime originated a scheme which they thought would solve the whole problem. This was nothing more nor less than placing the masses of rubber rags in a huge wooden tub lined with lead, and treating them with an acid solution. This solution ate out the fabric and left the rubber compound uninjured,—that is, theoretically. The superintendent, however, in his anxiety to destroy every bit not only of the fibre itself, but all appearance of it, was in the habit of boiling these rags so long in the acid that when the rubber was taken out, carefully washed and run on a mill, it had all the appearance of a gum that had been burned.

The first that I knew of this process, I happened to be over to the factory one day and saw a dozen or more men

out in the yard with three huge coal screens set upon wooden horses, over which they were beating what appeared to me the dustiest load of rags that I had ever seen. On examination I saw that this was rubber scrap, in which was still a certain amount of fibre turned to powder. I at once suggested the advisability of employing an ordinary revolving paper duster, which was done, thus dispensing with the service of a number of men. This stock, which was called "acid rag-stock," was very far from being satisfactory. The proper proportion of acid evidently was not there, and the careful manipulation of it had not been learned. There were times, too, when the acid was not washed out of the gum as it should have been, and it caused trouble. Then, too, in spite of its half-burned appearance, when one came to sheet it, it was the most horrible stuff to work on the grinder that I have ever seen. In a moment's time it would go from that dry condition to one of exceeding stickiness, and no matter how the mill-tender worked, it would go over the back-roll, and lead him such a chase as would puzzle the most skillful. I have seen men struggle with this obstinate, sticky, tenacious gum till the blood spurted from their finger-ends, and then not be able to keep the swiftly revolving rolls clear.

It is hardly necessary to say how far from these first crude attempts the present process of the manufacture of chemical shoddy is. To-day it is almost an exact science. The right proportions are known for both vulcanized and unvulcanized gums. The utmost care is taken in the removal, by magnets, of all iron, and the care with which the acid is washed out, and the tests that are brought to bear upon it to prove its absolute neutrality, are things that in those days were not even dreamed of.

Rubber Under Cultivation.

I WAS surprised while on a late trip between Vera Cruz and the City of Mexico," said an officer of the Standard Oil Company the other day, "at the extent of the forests of India rubber around Cordova, a beautiful place near the coast. These forests are plainly visible from the train. The trees are about 40 feet high, and on all sides the country bears marks of careful cultivation. The owners of the plantations have other products to handle, some of them very profitable, for a story is told of one of them who, on an investment of \$5000, enjoyed an income of \$20,000 per year. Some rubber is exported to Europe; very little, if any, to the United States. This is the place from which a report was given out that a syndicate of German capitalists had organized to place the product on the markets of the world. The climate is very warm, but this particular spot is the most attractive on the journey up to the table lands of the City of Mexico, and ought to be better known to the world."

TRAVELLERS who have penetrated into the forests on the borders of Lake Mataqua, Mexico, report large numbers of rubber trees that have never been tapped. A steamboat company is now forming to engage in the trade of carrying rubber, woods, and the products of the country to Virgin City, where a connection will be made with the Nicaragua Canal.

This is one of the possibilities in the rubber trade made practical whenever the canal shall be completed.

The Manufacture of Gas Tubing.

IT is constantly happening that lines of business of which the world in general knows but little, and which the casual observer would pronounce trivial, are found in many cases to assume large proportions. This in the last few years has been notably the fact in regard to the manufacture of flexible gas tubing for drop lights, gas stoves, elevators, etc. When one comes to consider the amount of flexible tubing that is used the country over, not only for drop lights in offices, dwellings, but for speaking tubes and a host of other uses, it takes but little reasoning to arrive at the conclusion that some mills must be busy in the manufacture of these goods.

The making of this tubing is a process of exceeding interest. The basis of it is the ordinary seamless tubing made by almost any rubber manufacturer. This, however, is not gas tight. In order to make it a fit conductor for so volatile a substance, it is necessary to cover it with a flexible non-porous body through which the fumes cannot pass. A compound that is much in use for this purpose is one made largely of glue and glycerine with a certain amount of vulcanizing material added. This makes a flexible rubber-like covering that effectually confines the gas. Outside of this is woven a braid of mohair or silk in any desired color, which gives it a beautiful finish. A large manufacturer in this line is what is known as the American Tubing and Webbing Co., at 52 Aborn Street, Providence, R. I. This house was established in 1883 and incorporated in 1890, and embraces not only the manufacture of these special lines of tubing, but also suspender webs and wicking for oil stoves. Their factory has a floor space of about 20,000 square feet, and is finely equipped with the best of braiding machines and other appliances necessary for their work. Their goods go to all parts of the United States, and are lately being introduced into the rubber stores of the country, the owners of the stores believing that the tubing trades belongs to them, for which reason they are making a push for it,

A VERY neat pamphlet, beautifully printed, and yet in its design and typography taking one back to the early days of printing, comes to us from the Employers' Liability Assurance Corporation, of which Endicott & Macomber, of Boston, Mass., are the managers and attorneys. Throughout the text of the pamphlet the quaint f's of our forefathers have taken the place of our modern s, and the wording, while clear and concise, bears a flavor of old-time courtesy and honesty. The pamphlet, which is called in the headlines "Circular," describes the business of the company, gives a list of the celebrated names that make up its officers, and mentions modestly that the subscribed capital is \$2,500,000, with a deposit of \$750,000 in the United States for the benefit of its policy-holders, which closes the first chapter. The description of the employers' liability policy is given in full in the second chapter, with curious marginal notes opposite the emphatic passages. The whole pamphlet is unique, interesting and valuable, and it will pay any manufacturer not only to send for it but to read it.

"I SHOULDN'T think the slush would bother whist players so much as other people."

"Why?"

"They're always ready for rubbers."

"DID you know that Skinner has pneumonia, and is not expected to live?" "No; how did he take cold?" "He got his feet wet going around trying to find where he could buy a pair of rubbers cheapest."—*Lowell Citizen*.

Letters to the Editor.

Fire Proof Insulation.

EDITOR INDIA RUBBER WORLD:—In your last issue, I notice an article in which Mr. A. C. Robbins calls for an improved fire-proof insulator for wire. I have been working on one for some time, and would like you to try the enclosed sample, which has rubber, cotton and a fire-proof compound, which will stand quite a heat. Tubing made of paper and felt, charged with the same compound, will also stand a very severe heat. A test of this sample will oblige very much. Yours truly,

THOMAS L. REED.

Providence, February 22, 1891.

[Accompanying this letter was a sample which we tested as to its inflammability in the flame of a gas-jet. After a time it charred, but in no part of the experiment did it catch fire. We are inclined to think that in this Mr. Reed has a valuable invention, and unless the cost of manufacture is such as to preclude its adoption, something that the electric light or insulating wire companies will be interested in. If Mr. Reed will kindly send us another sample, we will gladly hand it to our electrical expert, and have him report upon it.—EDITOR.]

Are You Interested in This, Mr. Reader?

LIVERPOOL, February 2, 1891.

The India Rubber Publishing Co., New York:

DEAR SIRS:—We beg to enclose you \$3 in English stamps, the amount of your subscription for the INDIA RUBBER WORLD.

We have several large parcels of rubber on hand that you might be able to put before some of your American subscribers, and if any transaction of importance should arise, we will be pleased to pay a liberal commission, and have no doubt if taken up with a good spirit in your country, a large business can be done, as we are in direct communication with the leading factories on the coast of Africa and South America. We would also be glad to promote a business with the States in waste rubber, as we usually hold the larger stock in the Kingdom having consignments weekly from all parts of the world, which at any time of the season amounts to 100 tons, and might lead to important business if properly pushed amongst the manufacturers.

Awaiting your suggestions, we remain, yours respectfully,
EYRE & COLLINS.

[Messrs. Eyre & Collins are well-known African and West India produce merchants.—ED.]

THE dearth of rubber caused by the exhaustion of some of the principal sources of supply has led to the serious consideration of rubber culture in Ceylon. Seed has been sown, and the seedlings are reported to be flourishing among the dense jungle. It is suggested that a large tract of country could easily be covered with profitable trees by simply collecting and sowing broadcast every year in the belts or useless jungles adjoining the estates, a few bushels of the seed of the Ceara rubber tree which grows in the island. These patches of rubber trees might in time come to be a much better and an infinitely surer investment than cinchona, which has been largely cultivated, now is.

RUBBER trusts are talked of, but Backbey, who slipped and fell just the same when his were on his feet, says: "Put not your trust in rubbers."

Recent Rubber Patents.

No. 444,035.—Pliers; George Wyatt, Brooklyn, N. Y. Pliers, the handles of which are covered by molded India rubber sleeves, being closed at their outer ends so as to embrace the ends of the handles, and provided with inclined inner edges.

No. 444,200.—Bottle-Stopper; Gerard C. Clark, London, England. A bottle-stopper made of one piece of hard material having a screw-threaded head and a stem or body which enters the bottle neck covered with a ring of India-rubber and provided with a screw-threaded cap or ring adapted to engage with the head, whereby the screwing down of the cap against the top of the bottle-mouth serves to raise and loosen the stopper.

No. 444,489.—Waterproof Leggin; Louis W. Groat and William J. Van Vleck, Hudson, N. Y. An improved leggin, composed of leather or analogous material, having straps at its upper end and vertical slots in its sides extending partly down the length of the leg; in which elastic goring is inserted and its lower portion continuous or unbroken, having the instep straps secured at each side of the lower ends, said leggin having also perforations through the upper portion.

No. 444,513.—Pessary; Edward W. Wagner, San Jose, Cal. The combination of the inflating-tube extending from the bulb, of the inner tube, open at its upper end, attached to and extending through the interior of the bulb and passing out through the walls of the tube.

No. 445,065.—Elastic or Corded Fabric; William Lapworth, Easthampton, assignor to the Hopedale Elastic Fabric Company, Hopedale, Mass. A fabric composed of face and back warps, binder warps, rubber or cord warps, and successive picks of weft-thread uniting the warps together, the face of the fabric being formed in ten-time motion, the face warps being each on the face or outer side of the weft for three picks, then on the inner or underside of the weft for one pick, next on the outer side of the weft for five picks and then on the inner side for one pick to complete the pattern, the back warps or weft being similarly or differently interwoven to form the back of the fabric, the face and back warps being united by the binder-warps passing from the back to the face of the fabric and *vice versa*, at each pick.

No. 445,092.—Eraser; William E. Simonds, Canton, Conn. A wedge-shaped stock which has a wedge-shaped sleeve together with a pliable erasive strip, all in combination.

No. 445,120.—Machine for Covering wire; George Lispenard, Brooklyn, N. Y., assignor to the Norwich Insulated Wire Co. The combination of a main frame, a revolving bobbin-holder having a vertical axis and constructed to support a bobbin or coil of covering-material concentrically therewith, devices for feeding a wire or core centrally through the bobbin-holder and through the bobbin, a holder for reserve bobbins above the bobbin-holder, and means for rotating the bobbin-holder and actuating the wire-feeding devices.

No. 445,141.—Woven Tape; Charles C. Hoyt, Revere, Mass., assignor one-half to the Hope Webbing Company, Providence, R. I. A tape consisting of longitudinal margins and a central strip of flexible woven fabric, together with raised longitudinal ribs formed by laying the weft around longitudinal rigid cords.

No. 445,358.—Non-Conducting Compound; Frederick Sprinkmann, Milwaukee, Wis., assignor one-half to William S.

Grubb, Chicago, Ill. A non-conducting compound consisting of a combination of kaolin, ground wood fibre, and the soft downy covering of cotton seed.

No. 445,523.—Button; Frank E. Hall, Newton, Mass., assignor to the Consolidated Fastener Co. A button provided with a button head and shank made in one piece, said head and shank piece having an inwardly turned retaining flange next the material and a rolled-in shoulder in the shank thereof, in combination with a separate flanged anvil piece within said shank, and a flanged clinching eyelet.

No. 445,544.—Weather Stripping; William H. Cosper, Chicago, Ill. Weather stripping, consisting of a flexible strip having an enlarged main or interstice closing portion, a web extending therefrom, and having a heel at its free end, a rigid strip embracing said web, and means located between the said heel and the main portion of the flexible strip for securing said web and embracing strip together.

No. 445,609.—Life-Saving Apparatus; William W. Riley, Cromwell, Conn. In combination with a boat or like floating structure, a rubber gas reservoir, a hollow mast, pipe connections from the mast to the gas reservoir, valves in the connecting pipe, the balloon adapted to be secured to the hollow mast, the flexible connecting part between the mast and the balloon, and the guard on the upper end of the mast, arranged to prevent the abrasion of the neck of the balloon.

No. 445,813.—Syringe; Henry G. Leisenring, Wayne, Neb. As an improved article of manufacture, a syringe consisting of the hard rubber rectal tip having screw threaded tapered portion, the hard rubber vaginal tip having screw threaded tapered portion engaging the threaded tapered portion of the rectal tip, and having reduced end, the bulb secured to the vaginal tip and comprising in a single piece a firm thick half and a flexible thin half, and a hard rubber handle secured centrally to the flexible half of the bulb.

No. 445,834.—Tool for Fastening Hose to Couplings; Charles E. Hudson, Leominster, Mass. The pliers for fastening hose to couplings, consisting of levers having a hinge in their adjacent sides, whereby the lever jaws are spread apart by the closing together of the handles, said jaws each being provided with a hole located within a distance from its end not exceeding two diameters of ordinary wire, or about three-sixteenths of an inch, for the purpose of insuring a sharp bend in the wire near its ends and securely holding the same until released by the spreading of the handles.

No. 445,913.—Handle for Velocipedes; Henry Waterson, Aston, England. A hollow elastic compressible India rubber handle or grip for a bicycle or other vehicle, having an air chamber containing confined air to form an air cushion, said air serving to restore the handle or grip to its normal condition after being compressed by the hand and then released.

No. 446,164.—Separable Bath-Tub; Marie Doelle, New York. A separable bath-tub consisting of detachable wall sections having devices by which the meeting edges of the same are connected with each other and inwardly extending flanges near their lower edges, and a detachable bottom plate supported by the said flanges of the wall sections, the lining to be a detachable lining of rubber or other waterproof material fastened to the upper edges of the wall sections.

No. 446,518.—India rubber Water-Bag; Albert A. Hesser, Schuylkill Haven, Penn. A water-bag of triangular or wedge shape, formed with a filling opening and side folds deepest where united to the end-piece and vanishing near the meeting edge of the two sides, and also a fold in the flat end, thus permitting the bag when filled to stand upon the end, or to lie flat when empty.

No. 446,520.—Weather Strip; James H. Hummel, Mount Vernon, N. Y. As a weather-strip, an arched metallic base having its edges turned or bent inward, combined with an elastic body having the form of a loop with its edges turned or bent outward in opposite directions, the respective outwardly-turned edges of the elastic body extending and being clamped between the main body of the arched metallic base and its respective inwardly turned edges, the construction being such that only one thickness of elastic body is clamped between the main body of the metallic base and each of its inwardly turned edges.

No. 446,692.—Vehicle-Wheel; Albert H. Overman, Springfield, Mass., assignor to the Overman Wheel Co., Hartford, Conn. The combination, with a rubber tire having a continuous interior air-space, of a hollow rim connecting with such space and forming an auxiliary air-chamber, an automatic air-pump mounted on the rim for pumping air into it consisting of a cylinder provided with inlet and outlet valves and a piston arranged to be operated by the tire when the same is inwardly displaced.

Reissue No. 11,141.—Air-Brake Hose Coupling; Amariah W. Jackson, Chicago, Ill. The combination, in a hose-coupling, for a gasket or packing located within the chamber of the coupling-shell and having a bearing-face to impinge against the wall of the gasket or packing, and an adjuster having screw-threaded engagement with the compressor for advancing and receding the compressor within its chamber, and have the advance of the compressor force and tightly close the gasket or packing circumferentially around its opening.

No. 440,633.—Portable Case for Fragile Articles; Herman, Hausmann, Chicago, Ill. A hollow case with a series of elastic longitudinal ribs projecting inwardly from the walls, with elastic end caps provided with annular flanges of a greater diameter than the case.

No. 440,649.—Bottle-Stopper; William H. Page, Burlington, N.J. A stopper consisting of a plug, provided with a flange and a perforated ball, these parts being elastic, in combination with a segmental spherical plate and a bushing, which are constructed to fit upon a bail, which forces the stopper into the neck of the bottle.

No. 440,684.—Apparatus for Facilitating Walking, Running and Jumping; Nicholas Yagn, St. Petersburg, Russia. This consists of a power-accumulator comprising a gas-holder adapted to expanded and collapsed, under internal and external pressures, respectively, and constructed for application to the feet, so as to support the weight of the body.

No. 440,702.—Wheel Tire and Rim; Sterling Elliott, Newton, Mass. In a wheel a rubber tire having a passage through it and also having an opening on the inner side communicating with the passage, combined with a flat binding-strip inserted into the passage through the tire, the ends of it passing through the opening in parallelism without crossing.

No. 440,743.—Elastic or Corded Fabric; William Lapworth, East Hampton, Mass. A two-ply elastic or corded fabric, consisting of face and back warps, rubber or

cord warps, binder-warps, and face and back filling or weft threads, the face warps floating in succession over the face weft for four picks and passing below said weft, but above the back weft, for two picks, the back warps passing outside of or below the back weft for four picks and above said back weft, but below the face weft, for two picks, the rubber or cord warps remaining stationary at all times between the two plies of the fabric, and the binder-warps passing alternately above and below the face and back wefts at each pick, the binders being thus changed with the wefts at each pick, and one-third of the face and back warps being changed with the wefts at each alternate pick only.

No. 440,868.—Elastic Woven Fabric; George C. Moore, Easthampton, Mass., assignor one-half to Joseph W. Green, Jr., same place. This is an elastic fabric provided at its edges with two rubber threads alternated with a weft and with each other at each pick.

No. 441,009.—Complexion-Mask; Nettie E. Jenkins, Auburn, N. Y. As an improved article of manufacture, a mask, glove, or equivalent covering for the skin, composed of a flexible material made up of caoutchouc, cinchonia, salicylic acid, Turkey myrrh, hydrastin, benzoic acid and sulphur.

No. 441,042.—Policeman's Club; Walter I. Underwood and Henry Frese, St. Louis, Mo. A policeman's club composed of a soft rubber core and a coating of less flexibility than the core.

No. 441,107.—Elastic Woven Fabric; George C. Moore, Easthampton, Mass. A woven elastic fabric composed of two independent plies or fabric united longitudinally at one or more transverse points by warp threads passing from one of the said plies or fabrics to the other, one of the plies having elastic warps disposed throughout its width, and the other ply being woven fuller than the ply having the elastic warps, whereby it will be shirred or ruffled by the contraction of the said elastic warp.

No. 441,165.—Non-conducting Covering; Henry W. Johns, New York. A non-conducting compound composed of a major part of wood pulp mixed with infusorial earth, magnesia, or a like material.

No. 441,412.—Thill-Coupling; Luther D. Haskell, Jr., Salem, Mass. An improved thill-coupling consisting of ears secured to an axle, the shaft-iron pivoted to the ears, combined with a yoke pivoted to a bolt on which the shaft-iron is pivoted, the yoke having a screw-threaded hub and a regulating screw adjustable therein, a metal washer, and a centrally perforated annular packing arranged within the screw-threaded hub, and a metal block interposed between the shaft-eye and the rubber packing having a cylindrical projection adapted to fit the perforation in the rubber packing.

No. 441,448.—Bottle-Stopper; Harry B. Stewart, St. Louis, Mo. A bottle-stopper consisting of a ball of suitable material adapted to be applied to the neck of a bottle, an elastic cord passing through the same, and connections for adjustably securing the elastic cord to the neck of the bottle.

No. 441,501.—Process of Manufacturing Rubber Goods; Goodman C. Mandleberg, Henry L. Rothband and Samuel L. Mandleberg, Manchester, England. Patented in England, France, Belgium and Austria-Hungary. The process of manufacturing India rubber garments which consists in partially vulcanizing the proofed or coated fabric, making the garments from such partially-vulcanized fabric and

completely vulcanizing and simultaneously deodorizing the garments. The process here described is in a word the spreading of cloth by the common process with one coat of rubber compounded with litharge, but with no sulphur, then with a rubber compound containing sulphur, and lastly with a rubber compound containing litharge but no sulphur, and exposing the fabric so treated to a temperature of about 250 degrees Fahrenheit to partially vulcanize it. The garments are then made up from the partially-vulcanized fabric in the usual manner and are subjected to a further vulcanizing and deodorizing temperature of about 260 degrees.

No. 441,502.—Process of Manufacturing Rubber Goods; same inventors as preceding number. The claims in this are, first, the exposing of vulcanized or cured garments to the action of air below the temperature required for vulcanizing and without the employment of deodorizing agents in the curing; second, the exposing of the garments to the action of dry air heated to about 200 degrees Fahrenheit; third, the exposing of garments to the action of dry air heated to about 200 Fahrenheit and then exposing the garments to the fumes of an essential oil or other scenting substance; fourth, the coating of a fabric with a rubber compound containing a vulcanizing agent in limited proportions, then with such a compound containing a vulcanizing agent in larger proportions, and lastly with a rubber compound devoid of a vulcanizing agent, vulcanizing the fabric so prepared and curing the same; the fifth, sixth, seventh and eighth paragraphs cover the points of vulcanizing the fabric, of deodorizing and perfuming the garments, of curing by the cold process and of deodorizing after that cure.

No. 441,503.—Process of Manufacturing Rubber Goods; same inventors as above. The process of manufacturing deodorized rubber garments or goods which consists in coating the fabric with rubber dissolved in deodorized petroleum naphtha, vulcanizing the coated fabric by the cold process, making the garments from such fabric, and cementing the seams with a solution of rubber in deodorized naphtha, and deodorizing the garments by exposure to heat.

No. 441,521.—Elastic Wheel Tire; George T. Warwick, Springfield, Mass. In a vehicle wheel, a hollow ring of elastic India rubber or gutta percha, having extended entirely around and within the annular space thereof and closely fitted therein a thin metallic contractible and expandible spring tube, combined with a rim having an annular concave seat depression for receiving and supporting the above specified tire.

No. 441,754.—Process of Manufacturing Seamless Tube Rubber Hose; Ernest N. Foote, Cleveland, Ohio, assignor to the Cleveland Rubber Company. A process in the manufacture of seamless hose of forcing the rubber tube upon a pole consisting of first introducing powdered soapstone into the tube, then closing one end thereof and inflating the tube with air, next drawing the open end thereof upon a stationary pole resting upon a movable carrier belt until said tube comes in contact with the belt, and allowing the friction between the movable belt and the tube and the escape of confined air within the tube to automatically force it onto the pole.

No. 442,675.—Toy; Curtis N. Wilcox, Brooklyn, N. Y. This is briefly described, a game apparatus consisting of two hollow rubber balls connected by an integral rubber ligament.

Every-day Work in the Factory.

BY NICK R. AUGUR.

A FRIEND of mine who runs a little rubber mill when he feels like work, and who lets his hands run it when he doesn't, recently sent in a roundabout way for me to come down and see him, which I did, and found him all cocked and primed with a story of woe. It seems he had been buying rubber from hand to mouth for some time, and he hated to carry it long enough to get it thoroughly dry. He, by the way, was one of the old-fashioned rubber men who went into the business when a man could afford to buy Pará rubber, and let it hang six months to get thoroughly dry and seasoned. He made money enough to be comfortably fixed and did not go out of business when he might have done so, and now competition keeps him pretty busy.

"Is there not some way that I can dry my rubber quicker than I do now?" he asked me, almost before I had got seated in his office.

"That depends on how quickly you are drying it at present," was my cautious reply, "and further," said I solemnly "I don't pose as a rubber expert,—I simple know a few facts here and there that I have picked up in the course of a varied experience. I may know a thing in one mill, but in the next mill my knowledge may be thoroughly upset by an entirely different condition of things. However, if you want to show me your drying-room, why lead the way, and if I know of anything that will be of help to you, it is at your service."

With that, we went to his drying-room. I had not been over his mill before in years, and I well remembered the first arrangement for drying-room that he had ever possessed. On the second floor of the rambling main building he had a number of wooden hangers, and over these were placed wooden squared sticks upon which the rubber hung. I well remember that the sheets of Pará were thick and coarse as they came from the washers, and showed none of that fine beautiful sheeting that the machinery of the present time gives.

It was with the remembrance of this drying-room in my mind that I climbed the stairs, and I frankly confess that I expected to see the rubber hanging and dripping its moisture down upon the same old pile of unvulcanized scrap that was there years ago. In this, however, I was happily disappointed,—he had actually built a new airtight drying-room, furnished it with steam pipes, and, as I stepped within its portals it was like going into a Turkish bath. The air was hot to suffocation and so full of moisture that it was like being in a steam-box. My friend was carefully studying the thermometer after wiping the perspiration off its face. Turning to me, he said :

"Now, this room is hot enough in all conscience, and if rubber will dry anywhere, it ought to dry here, but it takes almost as long a time to get it anywhere near dry as it used to when it hung out in the open room yonder."

"I should think it would take longer," I remarked.

"Why?"

"Because you don't give the moisture any chance to get out."

"Oh yes I do,—I have provided for ventilation," he said, and showed me a hole in the flooring above.

"Why don't you put in a ventilating fan?" I asked.

"Oh, I put one in, but it wasn't any good," was his reply, with quite a bitter emphasis.

"Well, I know a man who once bought a half-a-dozen rotten eggs, but he doesn't claim that there are no good eggs in the world on that account," was my sage reply.

"Well, tell me a good fan and I will try it," said he.

I gave him the name of one which I thought was a good one, which I will not quote here, as this is not an advertising article, and he said he would communicate with the party manufacturing it. Whether he will or not, I do not know, but his trouble has set me thinking. As I recall the various rubber drying-rooms which I have visited, I must confess that few of them have the best means of ventilation. It is absolutely necessary for the quick and economical drying of rubber that the air should be constantly in motion,—not the kind of motion that a fly fan gives to the air in a cheap restaurant, but it must be a movement that carries away the saturated vapor and allows of its being replaced by a dry warmer atmosphere. This of course may be accomplished in a variety of ways. The proper ventilating fan, however, is the prettiest device that I know of, and is as cheap as it is effective. One of these placed in the side of the drying-room will not only carry off an immense amount of damp air, but it can be so arranged that it can throw heated air into the apartment. In these days of keen competition points of this kind are worthy the most serious consideration of manufacturers. If a man can hurry up the drying of his rubber a week, he saves so much interest on the money invested, and it is unnecessary to enlarge upon the advantage that accrues from that.

THE tennis shoe has had an evolution which is mainly accidental. For a long time it was made of leather with rubber strips attached to the soles. Gradually it was found useful in other ways, and step by step its manufacture found its way into the rubber mills. It is now used particularly in the country, its peculiar flexibility making it a very comfortable shoe for rough walking. It is useful in yachting and all pleasure trips, but unlike its elder brother it is not intended to be used in wet weather. The old tennis shoe cost so much as \$5, and the popularity of the rubber is due to its cheapness which puts a durable, comfortable piece of footwear within the reach of every one that does not go barefoot.

THE constantly recurring labor troubles in Liverpool, and their effect on dock and storage charges, have become so annoying that the large rubber houses in their importations have adopted the plan of shipping goods to Hamburg, instead of that city. Hamburg is a free port with light charges, and the advantages presented by it as a storage point are becoming more and more prominent to English merchants.

A VERY PROVOKING CHILD.

MAMIE—Oh mother! mother! come quick! Baby's swallowed his rattle!

MRS. GREYNECK—Which one? the tin one or the rubber one?

MAMIE—The rubber one!

MRS. GREYNECK—Now how provoking that is! He has only had that rubber rattle three days, while the tin one he was tired of a year ago.

Trade Notes.

THE new brick storehouse for the L. Candee Rubber Company, on East Street, New Haven, will be completed by May 1. The work has been delayed on account of the bad weather, but will be pushed as rapidly as possible. This new house will save considerable expense to the company, which at present has to hire storage room.

—Maurice Baumann and Julius Lederer, of New Haven, have, with Samuel Lautenbach, of New York, and Ernest Schwencik, of Naugatuck, organized the Baumann Rubber Company, with a capital stock of \$10,000. The works will be located in New Haven.

—Some time since, after the failure of the Baring Brothers of London to successfully carry out a project to consolidate the four leading wringing machine companies of the United States, Joseph Banigan, president of the Woonsocket Rubber Company, became the American underwriter, and completed the consolidation on the original basis by securing a contract for the transfer of the Bailey wringing works of this city, making the payment therefor. The consolidated concern will be known as the American Wringer Company, for which a charter is now pending in the Legislature. The capital will be \$2,500,000. A majority of the stock will be owned in Rhode Island.

—The works of the Gossamer Rubber Company, No. 300 Federal Street, Boston, owned by I. M. & W. H. Conant, were recently broken into, and 21 macintoshes, valued at \$210, were stolen. Eight of the garments were recovered by a patrolman the next day.

—A selling company, for the purpose of selling the products of the Colchester Rubber works, has been organized. It is stated that \$300,000 of the capital stock has already been paid in. George Watkinson has been elected president of the company.

—The L. Candee rubber manufactory in New Haven gains 80,000 square feet of additional room by its new buildings, which are now nearly completed. The firm's offices will be removed to one of the new buildings in a few weeks.

—Lambertville Rubber Company, of Lambertville, N. J., are running full time, and orders are coming in which compare favorably with those a year ago.

—Work has again been resumed at the rubber shoe factory at Setauket, L. I.

—Schooner Anna R. Bishop, from Pará for Providence, with 700 tons crude rubber for Woonsocket Rubber Company lately arrived. This is the largest cargo of crude rubber ever consigned to a single importer, either American or foreign; and it is believed this is evidence of probability of opening big trade for this port, especially in importation of rubber.

—The foregoing item went into many newspapers all over the United States, and a day or two later was contradicted, the cargo being 220 tons instead of the large figure named.

—At a meeting of the directors of the Easthampton Rubber Thread Co., W. L. Boyden was chosen to the office of treasurer of the company in place of E. T. Sawyer, who recently resigned his position on account of ill health. Mr. Boyden has been teller in the First National Bank for the last five years and has also assisted with the bookkeeping in the Rubber Thread Co., and is thoroughly familiar with the work.

—An Ohio paper remarks facetiously that "the rubber trust appears to have been stretched too much and has gone to pieces," which would have been quite witty if there had ever been a rubber trust.

—Mr. Geo. B. Allen has opened a Chicago office for the Woonsocket Rubber Co.

—The Derby Rubber Company is making preparations to put the machinery in their enlarged plant. The boilers, grinders, vulcanizers and everything to be put in the new mill have been ordered and are now being made, and when the improvements in the factory buildings are completed the new machinery will be ready. The mill will be ready for running about the middle of this month, and then it will start up with the water power. The new factories and new machinery will increase the capacity of the company to double its present output without increasing the number of employés.

—The annual meeting of the South Framingham Manufacturing Co., which concern owns the Pará Rubber Co.'s buildings was recently held. The same officers as last year were re-elected, as follows: Directors: Franklin Manson, Charles F. Cutler, Wm. Clafin, Willis M. Ranney, Willard Howe; treasurer, Willard Howe; clerk, Sidney A. Phillips.

—The Kalloch Mfg. Co., has been changed to the Kalloch Rubber Mfg. Co., and to their line of dress shields and bustles, they have added a complete line of ladies' and gentlemen's mackintoshes and vulcanized rubber clothing, both cemented and stitched. Their factory is at Reading, Mass., the office being at 67 Chauncy St., Boston. The officers are J. M. Campbell, pres.; F. L. Kalloch, mangr.; A. W. Gore, treas.

—The stockholders of the Tyer Rubber Co., of Andover, Mass., have voted to double their capital stock and greatly increase their present manufacturing capacity. In the early spring work will be begun on the foundation of a large addition to their factory, which when completed will nearly double their annual product. The new building will be located on Main St., just this side of their present main building.

—Articles of incorporation of the Celluloid Enamel Company were filed in Newark, N. J., recently. E. W. Curtis, J. E. Rouse and H. C. Jenkinson are the incorporators, and they propose to enamel wood in this city, with a capital of \$50,000, of which \$1000 has been paid in.

—The Franklin (Mass.) Rubber Works, have just started up again, but are running only a small ticket.

—The Colchester Rubber Works have notified the boot-makers that they will have a furlough for an indefinite time. Work has been slack with the company, recently. For the past month they have allowed the boot-makers to make but eight pairs a day, for which the price paid was 15 cents a pair, or \$1.20 a day. The firm employ 1000 hands when running up to their capacity. The sudden suspension of work will cause considerable distress among the families of the employés.

—The Clifton Rubber Co., of Boston, have taken a longer lease of their plant at Clarendon Hills, and erected quite an addition to their main factory building.

—Mr. Geo. H. Hood, of the Boston Rubber Co., accompanied by his wife, has gone for a brief winter vacation to Cuba. He expects to be absent about three weeks.

—A fire was lately started in the drying-room of the Chelsea Wire Fabric Co.'s mill at Chelsea, Mass., but through the promptness of the factory force was almost immediately extinguished, the loss being only \$500.

—The New England Fire and Heat Regulator Co., whose temperature-controlling device is becoming such a popular attachment to vulcanizers in rubber mills, are the proprietors also of an arrangement for controlling the heat from a furnace or steam heater for private residences. They have put in many of them, in some of the best houses of Boston, and among others have just applied one to the heating apparatus in the Beacon Street house of Mr. Robert Evans, the president of the American Rubber Co., where it is doing most satisfactory work.

—A poem entitled "A Vacation Rhapsody," by a gentleman who is rapidly getting acquainted with the rubber trade through the excellence of his ventilating fans, is published in a Hyde Park paper. It is written by Mr. George H. Barney, of the National Ventilating Co., of Boston, and describes his summer's trip to Round Mountain Lake in the wilds of Maine with a vividness and gusto that make one long to be down in that paradise of the fisher and hunter.

—Mr. J. A. Pitkin, who is well known as an experienced salesman on general rubber goods, will in future represent J. Francis Hayward in the States of Connecticut and Rhode Island.

—Mr. W. C. McDonald will call on the trade in New Hampshire and Vermont, with a full line of rubber goods, embracing boots, shoes, clothing, hose, belting, packing and druggist sundries, all of which come from the well-known house of J. Francis Hayward.

—Lieut. Aaron S. Taft, of the Worcester Rubber Co., recently figured as floor director in the first of a series of socials arranged by the Worcester Continentals and held in the battalion's armory. The affair was an exceedingly enjoyable one, and many of the best people of the city were present.

—The Mattson Rubber Co., New York, have had an unusually good trade in dress shields this year. A good export trade has been had, but in this particular it is noticeable that the woman of the Tropics has little use for the shield, while her less favored climatic sister in Sir John Macdonald's country finds them indispensable.

—The Hoyt Rubber Co., of No. 6 Beverly Street, Boston, have removed their office and machinery to more commodious quarters to No. 260 Dover Street. Since the first of the year Mr. Hoyt has purchased the interests of his partner and now owns the whole business. The company are very busy at the present time and are doing a nice grade of mould work.

—The recent cold snap that fell upon New England with such rigor is thus explained by a leading Druggist Sundry man. It seems that Harry Doherty, the sales agent of the Davol Rubber Co., of Providence, recently went to Montreal, and being, as we all know, a gentleman of genial and expansive nature, absorbed nearly all the cold that was in that country; then he came back to New England and as the boys say, "He had a snap on the cold." This may not be a very lucid explanation, but it is going the rounds and we give it for what it is worth.

—The Mechanical Fabric Co., of Providence, R. I., is the name of a new concern who have put up a fine plant for the manufacture of rubber cloth for card clothing. Heretofore most of this had been imported from England, and this new factory seems to be a direct result of the McKinley Bill. The mill is a large brick structure, three stories in height, put up in the most substantial manner, has a fully furnished grinding and spreading room separate from the main building; a fine Armington & Simms engine, and a boiler made by the Charles River Iron Works.

—The New Jersey Rubber Co., whose plant at Lambertville has been just finished, has started up on full time with an exceedingly satisfactory trade.

—One of the aspirants for Senator Hearst's seat in Congress is Major Bonebrok of Los Angeles; he is noted as the Beau Brummell of Southern California, and is conspicuous about one thing in particular, which no doubt the rubber men wish the whole world would copy; he never goes anywhere without being provided with a pair of rubber overshoes.

—Mr. Geo. B. Burnham, of the Tyer Rubber Co., is off for a seven weeks' trip through Maine and the Provinces, where he has got his trade "solid."

—Mr. I. W. Dodge, manager of the New England Regulator Co., was recently met by one of our representatives in Providence, where he was taking very satisfactory orders for his temperature-controlling device.

—E. B. Pearson has lately gone with the large rubber house of F. D. Jaquith & Co. He has just returned from a trip through Pennsylvania and Ohio, and will remain at the Boston store of the firm.

—The American Rubber Co. are putting up a brick addition on Binney Street, in Cambridgeport, the dimensions of which are 40x65 feet.

—It is remarkable how the sight of crude rubber attracts such general attention. Messrs. Converse & Pike, of Boston, have in one of their windows a number of hams of old fine dry Pará rubber, which rubber men stop to look at and sigh over, and those who are not interested in the trade examine with a remarkable interest.

—Mr. Ernest Morris, the naturalist and explorer, who spent a number of years in Brazil and travelled a great deal during that time, is credited with saying: "Although the region close to the Amazon River has been well explored, people have no idea of the richness of that country in gums, woods, herbs, and particularly of the great abundance of rubber trees in that part through which the tributaries of the Amazon flow."

—In no way in the world can water be preserved so sweetly and for so long a time on board ship, particularly in the tropics, as it can be in barrels made of rubber. These are usually made of heavy friction fabric with a coating of rubber on the inside.

—The *City of Richmond*, which recently burned at the New York Dock, had on board of her 10,000 dollars worth of crude rubber, something that it is a pity to lose as prices are now ruling.

—The Rubber Stamp Manufacturers of California have had a meeting with a view to keep up a uniform price on their goods throughout the Pacific Coast.

—The Cleveland Rubber Co. send a very neat pamphlet on the cover of which is an interesting view of natives gathering India rubber sap by the bucketful, and on the back cover is a fine engraving of their complete plant. The booklet contains 60 pages, all of which is very interesting to buyers of rubber goods. It is well illustrated and speaks convincingly of the high grade of their goods in the line of elevator and main driving belts, seamless tube hose, steam hose and all the varieties of fire and cotton rubber-lined hose; packing, gaskets, valves, tubing, rubber-covered rolls, matting and stair treads, horse covers, and a variety of goods too numerous to mention are described and illustrated, and have prices affixed to them. The catalogue is exceedingly complete and very well gotten up.

—In the new plant of the Tyer Rubber Co., at Andover, Mass., will be a large addition to the present vulcanizing rooms, the steam plant will also be materially changed, a new boiler will be put in and a larger chimney built. The new factory building will be 75x100 and be of brick.

—The Alliance Waterproof Fabric Co. has opened a sales-room and offices at 5 Mercer Street, New York. This company represents the consolidation of the celluloid, zylonite, solid fibre and lithnoid interests so far as the manufacture of waterproof collars and cuffs is concerned. The sale of novelties remains at 427 Broadway.

—In this season of general complaint, it is refreshing to learn that the India Rubber Glove Co., are disposing of large sized quantities of goods. The sales of dress shields have been the largest known by the company, and all classes of goods are going to the consumer rapidly. The factories at Naugatuck are running full.

—Merchant tailors are buying largely in the way of rubber buttons for garments. An article well finished, in excellent imitation of diagonals, wide wales, and silk fabrics, and largely more durable, is not failing to make its way in the trade, and Newell Brothers, New York, and perhaps others, deserve great credit for the persistency with which they have placed these desirable goods on the market.

—Business with the Butler Hard Rubber Co., is in good proportions. The demand from electrical companies is well up to the average, notwithstanding the necessary high prices.

—Sixty box cars took the cargo of the *Anna R. Bishop* from Providence to Woonsocket. The Woonsocket Co. have a very good stock of rubber, for some large consignments have lately come to it in New York. This was lightered around to the Providence steamers, and sent on.

—Twenty-five cases of rubber were destroyed on the *City of Richmond* lately burned. The rubber it is said, was destined for a western Massachusetts company.

—Writing of a fire at their shops recently the Forsaith Machine Co. say of the Grinnell Sprinkler: Our watchman discovered the fire about ten minutes after it started and found the sprinklers working admirably, and before the fire department reached the shop the fire was practically extinguished, so no use was made of the city water, the sprinklers doing their whole duty. Three were opened. We made no claim upon the insurance companies. This is our second actual fire test of your sprinklers, and we would say that you are at liberty to refer any and all parties to us as to the satisfaction your sprinkler system gives.

—Mr. E. F. Bickford, Superintendent of the Boston Rubber Shoe Co., has taken a winter trip to the island of Jamaica.

—C. H. Brown, Esq., of the Brown Engine Works, Fitchburg, Mass., well known as builder of a fine grade of engines, some of which are in use in some of the larger rubber plants in the country, is spending the winter in Florida where he has large holdings of land.

—Mr. J. E. Martin, formerly with the Tyer Rubber Co., is at present handling the goods of the Ideal Rubber Co., of Brooklyn, N. Y., his territory being Boston and vicinity.

—A former stockholder in the old Hayward Rubber Co., and one who was a prominent director in its affairs, is a gentleman known to the rubber trade as "Buckle Joe." It is said that this name was given him by Mr. Yeomans, the purchasing agent of the Boston Rubber Shoe Co. It seems that Buckle Joe, or more properly, Mr. Joseph Hammond, had asserted that with the use of his buckle on arctics, the shoes could be unfastened without the use of the hands. The next time he entered the office of the Boston Rubber Shoe Co. Mr. Yeomans questioned this statement, and to his surprise Mr. Hammond in a flash released one of the buckles with one foot and kicked the arctic half across the room. Mr. Yeomans was so amazed that he humbly begged the other to call the arctic back, and dubbed him with the title which has stuck to him ever since.

—The Cornelius Callahan Co., Boston, scored a good point in selling the city of Worcester 2400 feet of rubber-lined cotton recently.

—Mr. D. B. Martin, the invincible travelling salesman of the Seamless Rubber Co., paid us a pleasant call last Tuesday.

—Boston and Wilmington capitalists have purchased a tract of land at Wilmington, Mass., and will erect buildings this spring, to be used as a plant for the manufacture of celluloid goods.

—The large building on Thirteenth Street, College Point, Long Island, formerly occupied by the Kleinert Rubber Co., has been sold to a Mr. Falk, of Hamburg, who intends to start a rubber factory there.

—Mr. W. N. Dale, of the Evans Artificial Leather Co., Boston, was a welcome caller at THE INDIA RUBBER WORLD sanc-tum recently.

—One rubber man who does not believe much in newspaper advertising lately distributed 120,000 circulars through the mail at a cost of \$1200 for postage alone. It is a question with us whether an advertisement distributed to 120,000 addresses and read by several times that number, and also preserved, all for a fraction of the money, is not the better investment.

—Charles H. Dale, the general sales agent of the Peerless Rubber Co., well acquainted with the clannish railroad man and his ways, for he has been one himself, has just returned from a successful Western trip, and the factory finds itself many weeks behind in orders as a result.

—The Peerless Rubber Company have made some extended improvements at their factory at New Durham, N. J. First an extension of 100 feet was added to the factory, then a 3000 Horse Power Corliss engine was bought, a new calender obtained, and two new grinders set up. The company added to their sales 60 per cent, in the last year.

—Mr. Theo. Hawley, well known to the rubber trade, is now in charge of the Pantdesota Leather Co., at Passaic, N. J., manufacturers of artificial leather carriage cloths, etc.

—Mr. James F. Butterworth, of David Moseley & Sons, Manchester, Eng., in a letter to a friend says that the English manufacturers are enjoying a good trade but are worried over the market for raw materials. If the speculators would let us alone we should be happy, is his closing remark.

—The firm of Dunlap, Lawton & Hall, Chicago, Ills., was dissolved by mutual consent February 21st. The business will be continued as heretofore by Messrs. Lyden C. Lawton and Richard C. Hall, under the firm name of Lawton & Hall, proprietors of the Duck Brand Co.

—Few buyers of rubber footwear have come to New York as yet, and they have gone East. Western buyers generally go to Boston first, running out to the various factories around that city during the day time, and bartering with the merchants in the hotels in town in the evening, returning here to complete their assortments. The purchases of leather goods, which are more important, have a tendency to form this routine, Haverhill, Lynn, and other New England cities being the seat of that trade. Southern buyers are more apt to stop at first in New York, but they have not yet appeared here.

—The American Rubber Co. in New York have opened the new extension to their store, and now have as nice and commodious warerooms as can be found in New York. On Church Street, there is a front of 40 feet which extends back 100 feet where it meets the Reade Street extension with dimensions almost as large. Both are thrown into one spacious room, which is well lighted and nicely arranged to expose all the different goods manufactured by this company. On the Reade Street front are two nicely carpeted and furnished offices, one for the book-keepers and the other for Mr. Geo. B. McLellan, the manager. There are two other floors for the storage of goods. The fittings are in the most approved style, and everything is of a character befitting the magnitude of the company's operations.

—The Cleveland Rubber Co., have just completed extensive improvements in their boiler room, expending over \$12,000 in resetting old and putting in new boilers, increasing the capacity about 700 H. P. They have the Murphy automatic furnaces, and have also introduced an appliance by which coal is taken from the cars on their side track and delivered automatically to the furnaces. As they consume over 30 tons of coal per day, the saving in handling thereby affected will be a considerable item. It is said that this is a model boiler room.

—A recent mail brings one of the most artistic booklets in the catalogue line that it has been our fortune to see. It is devoted from cover to cover, to the description and illustration of rubber mats. Out of hundreds of patterns about fifty are shown by engravings that are most excellent in taste and finish. A feature that at once attracts attention, is the color printing, showing the variety of colors that may be incorporated with rubber compounds, thus making beautiful mosaics, handsome borders, and designs, and combinations almost without number. Special mats adorned with monograms in black, red and white. Signature mats faithfully copying the name of the owner in his own chirography, step treads, dentists, and barbers' mats, and a host of other novelties are here shown. The whole pamphlet bears the impress of progressiveness and good taste. The front cover particularly will catch the eye, as it shows an elegant stairway, every stair of which bears a fac-simile of an artistic design in stair treads. Issued by the New Jersey Car Spring & Rubber Co., Jersey City, N. J.

—Nature has got out her hose and has given the whole country a good drenching in all sections. Business in consequence has turned very dull. She never does anything by halves, but is very apt to overdo the matter, and this time is no exception.

—The Woonsocket Rubber Co. have published a neat edition of their catalogue for pocket use. It is neatly bound in cloth with Suede colored covers.

—The Boston Gossamer Company are having a fine success with the sale of their Inverness waterproof garment. It has only been on the market a short time, but its excellent qualities have been well proven.

Notes From New Orleans.

MESSRS. J. LYONS & CO. carry an immense stock of everything known in rubber suited to the notion and drug trades, and are a live and progressive firm; school books and supplies have also been an addition line with them.

It would require considerable stretch of the imagination to take in the scope of Messrs. Finlay & Brunswig's stock.

Messrs. Koenig & Son, the Canal Street toy dealers, display a stock in general toys and rubber goods which delight the eye of the children and surely cause the shoe strings of parental pocket-books to untie themselves.

Messrs. Baker, Sloo & Co. are well quartered in the building formerly used by A. Baldwin & Co., and have an ample and well-displayed stock, counting among their representations some of the staunch mechanical rubber manufacturers of the country.

Messrs. Smith & Boullemaat, who were temporarily dislodged by fire, have moved back to their former location but into their new store on same site and have it full of stock ready for call.

Messrs. Herter & Rice are a young pushing firm and control a large and satisfactory trade.

Messrs. E. J. Hart & Co., our old veteran druggists, move a magnificent trade and Mr. Hart now enjoys the full fruits of good judgment and discretion. Mr. Hall, the manager of the firm, is a genial and highly capable man, and is one of our enterprising citizens.

The Standard Rubber Co., of Boston, have shown through their Southern agents, the Southern Office and Sample Room, a magnificent line of gossamer and form fittings for women and children and fine vulcans and mackintoshes for men and boys.

The New Jersey Car Spring and Rubber Co., of Jersey City, likewise offer their well-known staple and Pará mechanical goods, hose, mats, etc., through the Southern Office and Sample Room, who are their agents in the South.

Crude Petroleum as a Fuel.

THE experiment of burning crude petroleum is one that has many times interested manufacturers. There have been many difficulties in the way of the practical introduction of this kind of fuel on a large scale. Several systems have been tried and were very far from satisfactory from an economical standpoint. A new system that is said to be so far very successful is at present being tested in the Tremont & Suffolk Mills, Lowell, Mass. One of the first methods of handling this fuel was through a system of changing it into gas.

This plant for this new fuel consists of two cylindrical tanks, holding about 8000 gallons, which are placed outside of the steam plant. From this reservoir a tube passes to the boiler-room where a pump forces it into another tank, where it is kept at a pressure of say 60 pounds. A safety valve is attached, which prevents too great a flow of oil into the tank. From this point the oil passes down into the front of the firebox through an eighth inch pipe, which in turn runs into a $\frac{1}{4}$ inch pipe leading up through the ash-pit into a large iron cylinder 4 inches in diameter standing in the fire box and hermetically sealed. Inside of this cylinder the oil is changed to a gas by the action of the heat. There are four of these cylinders with connections in one fire box. The $\frac{1}{4}$ inch pipe through which the oil pipe passes forms a passage-way for superheated steam. This steam is controlled outside of the boiler front by four valves at each of the four connections, and the oil is also controlled by four valves, making eight valves to one boiler. Leading from the bottom of the large standing cylinder in the fire box is a $\frac{1}{2}$ inch pipe, which connects with the burners running across the fire box just on the outside of the furnace doors. These burners are a 3-inch pipe perforated with small holes through which the gas generated in the large cylinder rushes with a fierce flame, creating the most intense heat.

The Tremont & Suffolk Mills use about 10,000 tons of coal a year. They have consumed about 12,000 gallons of oil under one boiler in a little over five weeks, and the entire battery of boilers would burn at the same rate 216,000 gallons in five weeks, or about 1,944,000 gallons in a working year.

If this sort of fuel is to be any cheaper or better in its results than coal, no line of manufacture will appreciate it more than the rubber industry as they are among the largest users of heat of any manufacturing business, and no doubt the experiments with crude petroleum will be watched by them with a great deal of interest.

EXPLAINED.

EDGELY—Here's a remarkable story in the paper. A man fell off a nine story building; he bounded up several times high in the air and then came down on his feet, and walked off as if nothing had happened.

WOODEN—My stars! How do they account for it?

EDGELY—Why, he was the owner of some very large works.

WOODEN—What had that to do with it?

EDGELY—Well, you see, his works were rubber.

Early Times in the Rubber Trade.

1849. H. G. TYER and JOHN HELM patented an improvement in the manufacture of India rubber, which was a combination of caoutchouc with either carbonate of zinc, or sulphate of zinc.

Charles Goodyear patented an improvement of uniting felting with a cotton-fibre to caoutchouc. He afterwards surrendered his claim to this patent, and placed it in another form, applying it to boats. His early patent for a rubber cement expired this year. Mr. Goodyear had now been busy several years exploiting his inventions and establishing licensed manufactories. The Goodyear India Rubber Glove Co. had built a small mill at Naugatuck, Conn. (1844), and this was his favorite headquarters for operations. He favored the issuance of licenses for special lines, giving one party exclusive right to manufacture shoes, another clothing, etc., a system he maintained until the final expiration of the controlling patents, 1862.

F. M. Ray placed helical springs within hollow springs made of metallic or vulcanized India rubber, claiming that this mode increased the tension and prevented spreading.

Charles Walker applied caoutchouc to the rubbing surfaces of rice hullers.

In England, John Dalton applied gutta percha to calicoes. His composition was five pounds of gutta percha in one gallon of benzole, naphtha, spirit of turpentine, camphene, bisulphuret of carbon, or other proper solvents, preferring, however, benzole or bisulphuret of carbon, as they are exceedingly volatile.

John Edward Payne patented improvements in marine vessels, in life preserving apparatus, and in the making of hollow figures.

The manufacture of cables and insulated wire for telegraphic purposes at this time received a great impetus from the special adaptation of gutta percha to this new want of civilization. The only manner of crossing streams was by stretching wires between tall masts, obviously difficult of construction and maintenance, or subjecting communication to intermittent interruption at draw-bridges, a system that would not be tolerated at the present day. In this year we have a record of the first cable laid in this country, at a locality on Hudson River between Fort Lee, New Jersey, and 125th Street, New York City.

1850. F. D. HAYWARD and J. C. BICKFORD patented an improvement for spreading rubber by pressure on rollers, and at the same time grinding and fixing it against, and into the substances of the cloth.

John Pridham combined oxide of tin with caoutchouc; this with sulphur produced a fabric with a black surface.

Peter Dorn made a half shoe similar to the present foot-hold.

Jonathan T. Trotter made use of zinc hyposulphites in place of free sulphur for vulcanization. The hyposulphites were placed in a solution of caustic lime, potash or other caustic alkali, boiling the flowers of sulphur until the liquor is saturated. Into this liquid pass sulphurous acid gas for the purpose of obtaining a hyposulphite of alkaline base. The liquid was allowed to cool, and the clear por-

tion was decanted into a vessel containing a suitable quantity of a saturated solution of nitrate or other analogous salt of zinc. On mixing these solutions, the zinc is precipitated in a white powder. It is then washed, dried and subsequently ground in a combination of 3 pounds of this powder with 10 pounds of India rubber heated to a temperature of 260 or 280°.

S. T. Armstrong and C. J. Gilbert used lime, or other alkaline substances with heat to neutralize the acid, or acids, contained in gutta percha in its native state. The lime was calculated to improve the quality and preserve it from deterioration and protect it from the atmosphere or heat.

In England, Ernest Werner Siemens, a name which entered largely into the inventive world, patented an improved method of insulation. Wire for underground purposes was coated with a combination of gutta percha and sulphur, the former entirely freed from water, and the latter mixed with it in a very fine powder by means of rollers, and the chemical combination effected by heating the mixture in a steam chamber. This compound has great hardness.

Patents in England were also taken out by foreigners for making "clogs" of India rubber sponge, and also the using of shellac in the manufacture of caoutchouc with or without the application of artificial heat.

1851. CHARLES GOODYEAR obtained patents for the making of hard rubber goods. He treated caoutchouc, or gutta percha, or a combination of both with sulphur, the whole being mixed at a high temperature, say 300° Fahrenheit. He also introduced into this compound other substances in great variety, both mineral and vegetable, using a masticating machine. Further experiments proved to him that all these foreign compounds were of doubtful utility, and he gradually abandoned them for sulphur alone, making the proportion in its use of one to four. He united this hard rubber to iron and other metals in different ways.

John Wallace Duncan in England attempted to make engine wheels of gutta percha, by mixing with that gum cannel coal, jintowan, or catimunbo, all ground in a masticator and heated to a temperature of 350 degrees.

Jonathan T. Trotter used zinc without sulphur for vulcanization.

Nelson Goodyear used sulphur with or without shellac for making hard rubber. He also used carbonate or sulphate magnesia, or of lime, with or without shellac for the same purpose.

Horace H. Day made shoes of several parts of different degrees of elasticity, uniting them afterwards.

1852. CHARLES GOODYEAR, for the purpose of reducing the cost of vulcanization, used coal tar in large quantities, adding it to the combination of caoutchouc and sulphur. He also obtained a patent for the manufacture of combs and gave them an ivory-like texture by gradually heating caoutchouc and sulphur made into sheets to a temperature of 300 degrees, retaining such heat during certain lengths of time. He also obtained patents for making umbrella and parasol sticks by certain defined processes of heating. Another patent suggests the manufacture of gun

and pistol stocks, using a compound of two pounds of caoutchouc to one of sulphur. His patents at this time show that he preferred no other substances to mix with caoutchouc than sulphur. At this time he seems to have entered the field of insulation, using in this connection caoutchouc, sulphur, gutta percha and pitch. He formed the compound into sheets, after which it was moulded. In moulding work he filled up the cores with sand. He sought to manufacture telescopes, picture frames, book covers, etc., harness trapping, furniture; in fact, the list is well-nigh innumerable, taking a base of caoutchouc and sulphur and introducing other substances whenever indispensable to form any individual article.

John Macintosh, England, made packing by using cuttings of vulcanized India rubber, burning them until it made a black and partially fluid product, which is mixed with charcoal, black-lead and lamp black. He also invented a paint which would not crack, or blister in hot climates of decomposed mixed with oils and metallic salts.

Charles Weightman Harrison, England, invented an insulator, consisting of caoutchouc dissolved in naphtha with creosote and shellac.

M. Perrot, of the Paris Academy of Sciences, succeeded in making gutta percha as fine as paper, upon which was taken lithographical impressions. It was claimed that gutta percha would allow the reverse of any object to be obtained without redrawing.

1853. GUSTAVE EUGENE MICHEL GÉRARD took out patents in England based upon the discovery that caoutchouc heated to 240 degrees will retain a greater expansion than in its natural shape. Ochre, chalk, oxide of zinc, 25 per cent., with essential oil 10 per cent., was combined with it. Out of this spun rubber was made by stretching it to a maximum length, and submitting it to the stated temperature. The point in this patent seemed to determine at that time the proper heat for spun rubber manufacture.

Charles Goodyear ornamented gold or silver metals with rubber designs stamped into the metal. He also made improvements in the manufacture of brushes, made rubber slates and pencils, cleansed rubber of impurities, formed graduated scales, inventions full of detail, with very little practical variation from his former modes. He also made moulds of pulverized soapstone, or other granulated adhesive powder, which he placed in a box and heated to a temperature of 200 or 300 degrees from three to seven hours, when the articles were vulcanized. He also improved the method of coating arctic boots, made wholly, or in part, of different materials, with points of caoutchouc or gutta percha, and vulcanizing them.

William Christopher, England, made improvements in devulcanizing rubber by macerating it in alkalis, or lime.

Eugene de Varroc, a Frenchman, perfumed rubber by exposing it to saturated currents of air, or bathing it in solutions of lime.

Considerable interest was taken in England and other countries in the investigations of the muddar plant by Dr. Reddell. It was used by the natives for the manufacture of garments. It grows like a weed, and is very plentiful.

It was however difficult to gather on account of a poisonous attribute, and was abandoned as a substitute.

An Attractive Publication.

A SINGULAR saffron-colored folder is just about this time going the rounds among the rubber shoe men, and by its ingenious wording attracting a deal of attention. The outside cover bears a picture of an ugly Japanese god and the lettering in red and black "Tennis—Sage & Co. Prices for 1891." On the first inside cover are the net prices for 1891 of the Colchester, Candee, Brook Haven and Racket goods. On the second page adorning the centre is a queer Japanese coin with a square hole through the middle, and the following inscription:

Japanese merchants have some curious customs. They neither send out drummers, or advertise in the newspapers, nor do they deluge the trade with circulars, or samples. But if they can obtain a coin, amulet, or token blessed by some Sage of authenticated reputation, they send it to the desired customer as an omen of good luck. It is a point of oriental etiquette, never overlooked, for the recipient thenceforward to reward the donor with his trade.

An American Sage, learning of this custom through his wide researches, with wonderful enterprise and at great expense, secured a large number of such coins, which had been taken from the shrine of great HANKI-PANKI, whose name signifies "Good Luck." Herewith we send you one of these, trusting that the spell will work as well in the United States as in the Flowery Kingdom of the Mikado, and that you will respond in the way of orders for Rubber Tennis Shoes, the prices for which are hereby submitted with true oriental politeness, awaiting which, with broad smiles of expectation, we remain, as ever, your most humble servants.

SAGE & CO.

P. S.—We give the coin, you do the rest.

"Carrying Coals to Newcastle."

MR. J. FRANCIS HAYWARD, of Boston, with his assistant, Mr. Bryant, made a flying visit to Cleveland a short time since, and thoroughly inspected the large plant of the Cleveland Rubber Co. He must have been favorably impressed with their manufacturing capacity and have satisfied himself that their line of Mechanical Goods, Clothing, Mackintoshes, Druggist, Surgical and Stationery goods were of superior merit, as he arranged to handle them exclusively, and will hereafter act as their New England Agent. Mr. Hayward has had an extended experience in the rubber line, has eight rubber stores in the principal business centres of New England, and has built up a large and successful business.

The Rubber Market.

AS the season advances the rubber situation becomes more interesting. Prices are steadily advanced in Pará, and manufacturers are, on the other hand, with one or two exceptions, complaining of dull business. Yet there is no crisis, or culmination in sight; the Brazilian who has the mammoth speculation in charge is not yet satisfied, and while those who are near to him say he will be content with \$1 per pound, others who know him well enough to speak of him advisedly, say that when he reaches that point he will not stop, but will claim higher figures. During the past month prices have crept up with slight reactions until 89@91c., ex-vessel, has been

The "CLARK" WIRE



INSULATION GUARANTEED WHEREVER USED, AERIAL, UNDERGROUND OR SUBMARINE.

In a letter from the Inspector of the Boston Fire Underwriters' Union, under date of March 29, 1880, he says:—
"A THOROUGHLY RELIABLE AND DESIRABLE WIRE IN EVERY RESPECT."

THE rubber used in insulating our wires and cables is especially chemically prepared, and is GUARANTEED TO BE WATERPROOF, and WILL NOT DETERIORATE, OXIDIZE OR CRACK, and will remain flexible in extreme cold weather, and is not affected by heat. The insulation is protected from mechanical injury by one or more braids, and the whole slicked with Clark's Patent Compound, which is water, oil, acid, and to a very great extent fire-proof. OUR INSULATION WILL PROVE DURABLE WHEN ALL OTHERS FAIL. We are prepared to furnish Single Wires of all gauges and diameter of Insulation for Telegraph and Electric Lights from stock. Cables made to order. We are now prepared to furnish our Clark Wire with a WHITE OUTSIDE FINISH for ceiling cleat work as well as our standard color.

CLARK JOINT GUM should be used for making water-proof joints. This is put up in half-pound boxes, in strips about one foot long and five-eighths inch wide, and when wrapped about a joint, and pressed firmly makes a solid mass.

FOR RAILWAY AND MOTOR use, we make all sizes of stranded and flexible cables with Clark insulation. Wire Tables and price list will be furnished on application to

HENRY A. CLARK, Treasurer and General Manager.
HERBERT H. BUSTIS, President and Electrician.

Mention the India Rubber World when you write.

EASTERN ELECTRIC CABLE COMPANY,

61 to 65 Hampshire Street, Boston, Mass.

Steam Boilers, Vulcanizers, • Tanks, Plate Iron Work.

ROBERT'S IRON WORKS CO.

92 MAIN ST., CAMBRIDGEPORT, MASS., U.S.A.

Builders of ^{First-class} Steam Boilers. FOR HIGH PRESSURE.

Construction—Butted Jointed Longitudinal Seams, Triple Riveted, Rivet Holes drilled in place.

CORRESPONDENCE SOLICITED.

Mention the India Rubber World when you write.

THE NEWTON RUBBER COMPANY.

Factory: Newton Upper Falls, Mass.

Office: 116 Bedford Street, Boston.

E. R. RAND, Manager.

H. G. PARK, Sup't.

The only Company that, while making a general line of Mechanical Goods, make a SPECIALTY of the manufacture of

Rubber Springs and Valves.

IMPORTANT

TO ALL

EMPLOYERS OF LABOR.

Deposited in U. S. \$845,000.00.

POLICIES issued giving full protection to Employers against loss by claims from Employees on account of Accident. Rates proportioned to risks of occupation. One premium the only payment during year. No contingent or other liability on part of Employer. Employers with Pay Rolls of \$103,000,000 already covered in the United States. No employer should be without this Protection. Cases investigated by Competent Inspectors and considered by Eminent Counsel. If liability shown, claims settled without litigation.

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